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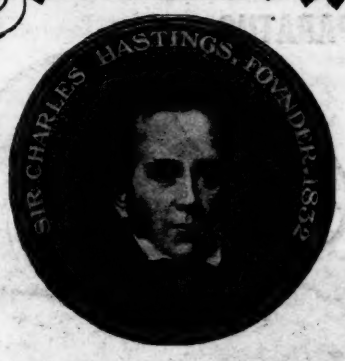

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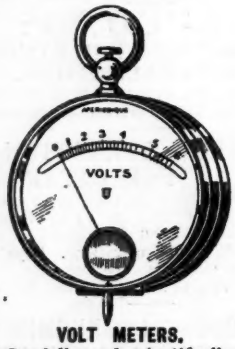

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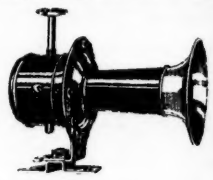

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THE DIFFERENTIAL DIAGNOSIS BETWEEN FUNCTIONAL AND ORGANIC PARAPLEGIA.

BY

R. T. WILLIAMSON, M.D.LOND., F.R.C.P.,

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THE differential diagnosis between functional and organic paraplegia or paraparesis is now of much interest on account of the large number of both affections in our military hospitals.

It is important that cases of malingering or of functional paraplegia should not occupy hospital beds for long periods or continue to receive pensions for months or years. It is equally important that men who have done their best to serve their country should not be regarded as cases of malingering or functional paraplegia when they are suffering from organic disease. The detection of indications of commencing organic affection in slight cases, and at an early period of the disease, is also most important.

It is desirable that malingerers should be at once recognized, and that cases of functional paraplegia should be very promptly treated and cured as early as possible by some means. But a definite differential diagnosis between functional and organic cases is necessary before this can be done.

In many cases the differential diagnosis is easy, in others extremely difficult and only possible after repeated careful examinations. Further, we have to bear in mind that functional symptoms may be associated with those of organic disease.

The most valuable indications in the differential diagnosis between functional and organic paraplegia are well known to those who are interested in nervous diseases and need only be briefly named. In this article I desire to draw attention to a few additional indications that I have found very useful in my own practice, and especially to the value of two signs—isolated loss of the vibrating sensation and loss of the tendo Achillis reflex.

The following are well known points in the differential diagnosis, and others might be mentioned:

Paralysis of the bladder, with incontinence of urine (overflow incontinence, or constant dribbling of urine), points to organic disease; it does not occur in functional paraplegia, though in this condition retention of urine occasionally occurs.

Reaction of degeneration on electrical examination of paralysed muscles is found in some cases of organic paraplegia; it does not occur in functional paraplegia.

Marked localized atrophy is not conclusive, but it would be in favour of organic paraplegia. Detection of bullets and foreign bodies, fractures of vertebrae, or of their laminae or processes, by *x*-ray examination, signs of aneurysm, caries, or growth, etc., are valuable indications in favour of organic disease of the spinal cord in certain cases.

History of a girdle pain, of root symptoms, or of severe pain in the back, for some time previous to the onset of paralysis are points in favour of organic disease, and especially if anaesthesia can be detected in the distribution of the spinal nerve roots at the level of the girdle pain.

Crossed paralysis—marked paralysis of the leg on one side and of the arm on the opposite side, whilst the other leg and arm are less affected, or paralysis of the leg on one side and anaesthesia of the opposite leg—would be in favour of organic disease.

Sensation.

If anaesthesia is detected, and its distribution and limits correspond exactly to those which have been established for *transverse* lesions at different levels of the spinal cord, then organic disease may be diagnosed. Thus, for example, transverse lesion of the lower end of the cord (third sacral segment) will produce anaesthesia in the gluteal region and scrotum. If higher (up to fifth lumbar segment) the lesion will cause anaesthesia down the back of the thighs, outer side of legs, and soles of the feet, in addition to the area of anaesthesia just mentioned, whilst the front and inner side of the thighs and the inner side of the legs will not be anaesthetic. Similar area of anaesthesia may be caused by lesion of the cauda equina. If the lesion extends to the first lumbar segment the anaesthesia will extend to the groins, and the whole of the legs, the scrotum, and gluteal region will be anaesthetic.

In an organic spinal *transverse* lesion, if both feet are anaesthetic, the scrotum and gluteal region will be also anaesthetic. If the gluteal region and scrotum are not anaesthetic when the feet are anaesthetic, then the affection may be functional or due to peripheral neuritis, or a very limited spinal lesion, but we should require other signs to enable us to diagnose between the two. We may state this in another form—if the case is functional and the upper limit of anaesthesia is below the middle of the thigh, then the scrotum and gluteal region will probably *not* be anaesthetic.

If the anaesthesia extends up to the groin, the scrotum and the gluteal region will also be anaesthetic in organic disease due to a *transverse* lesion. If the scrotum and the gluteal region are not anaesthetic, in a case of paraplegia with anaesthesia extending up to the groins, *transverse* organic disease of the cord can be excluded and the case will probably, though not certainly, be functional or due to peripheral neuritis.

The limit of anaesthesia is of value in diagnosis. In a case of paraplegia, if sensation to touch is lost in both legs and the upper limit of the anaesthesia is a transverse line across the long axis of the leg (that is, at right angle to the long axis) at the knee, or just above or just below the knee, functional affection or peripheral neuritis is more probable than a spinal transverse lesion.

These are points of diagnostic value well known to those who are interested in nervous disease, and many others might be added.

Reflexes.

The diagnostic value of changes in the reflexes is well known. Loss of knee-jerks would of course indicate organic disease. Diminution of the knee-jerks cannot be considered of diagnostic value. When the knee-jerks are obtained in cases of paraplegia we have the various forms of spastic paraplegia to consider; we have often in such cases many points of diagnostic value in favour of organic disease—sustained ankle clonus, "clasp knife" rigidity, rectus clonus, and especially the Babinski and Oppenheim's reflexes. The Babinski or Oppenheim reflexes may be the only definite indications of organic disease in cases of early organic paresis of the legs. The other changes just named and other signs of organic disease may be absent at first. Also pseudo-ankle-clonus and pseudo-rectus-clonus are occasionally observed in functional paraplegia. The clonus, however, is not a sustained clonus. Usually the difference is easily detected, but in extremely rare cases it may very closely simulate a true clonus. A definite Babinski reflex does not occur in functional paraplegia.

The importance of these changes in the reflexes and of the other signs named is well known, but in certain cases the diagnosis is very difficult. The signs already named cannot be detected, or they are indefinite. In certain cases of paraplegia or paraparesis from tumour affecting the spinal cord—diagnosis verified by autopsy in some cases, in other cases clinical diagnosis of spinal meningeal tumour very probable—I have found the reflexes normal for a period at first; the knee-jerks have been normal, and ankle clonus and the Babinski reflexes have not been obtained. But usually in these cases we have a history of root pains or root symptoms for some time before the onset of paresis, and in course of time, often in a short time, the Babinski reflexes and ankle clonus are obtained.

In this article, however, I desire to draw attention especially to the value of two signs in differential diagnosis—(1) loss of the tendo Achillis reflex, and (2) loss of the vibrating sensation, when other forms of sensation are unaffected.

Value of the Tendo Achillis Reflex.

In many cases of functional paraplegia the plantar reflex is not obtained, and if all other reflexes are normal, loss of the plantar reflexes is a point which should lead to careful consideration of functional disease. The plantar reflex is lost in many cases of organic disease, but in such cases usually other reflexes are affected.

In some cases of paraplegia from organic disease we find the plantar reflexes lost, but the knee-jerks obtained and no ankle clonus. This condition of the reflexes may therefore be found both in functional paraplegia and in organic disease. Usually the testing of the tendo Achillis

reflex enables us to decide between the two conditions. The tendo Achillis reflex is *always* obtained in such cases if the disease is functional. When the Achillis reflex is lost the disease is always organic. But we cannot state the converse, that when the disease is organic the Achillis reflex is always lost. In some rare cases of organic disease the plantar reflex is lost and the Achillis reflex obtained.

The spinal reflex arc that must be intact if the plantar reflex is obtained is situated in the first and second sacral segments of the spinal cord. Just above this is the arc on which the tendo Achillis reflex depends (fourth and fifth lumbar segments). If the plantar reflexes are lost in organic disease, usually by extension of the lesion, the tendo Achillis reflexes are also lost; but in functional disease the tendo Achillis reflexes are always obtained. Hence the value of this tendo Achillis reflex in differential diagnosis. It is desirable to test the Achillis reflex in all cases whenever the plantar reflex is lost.

The tendo Achillis reflex is of special value also because it is very often lost in many cases of organic disease before the knee-jerk. Thus, in peripheral neuritis of various forms (alcoholic, diabetic, etc.), and in tabes at the onset often the Achilles reflex is lost before the knee-jerk. It may be lost when the knee-jerk has never been affected, as in some cases of poliomyelitis (chronic and acute); and it is lost on the affected side in many cases of sciatica. In testing this reflex the patient should turn on one side, if paralysed in bed, or he should kneel on a chair with the feet hanging down over the edge of the seat of the chair, and the calf muscles should be relaxed; or he should kneel with one knee on the chair and place the other foot on the floor at the side of the chair.*

The reflex is, of course, unexpected by the patient and not likely to be influenced by him voluntarily.

The Vibrating Sensation.†

The vibrating sensation is often of much service in the diagnosis of organic from functional affections. In cases with marked affection of sensation, organic and functional, the vibrating sensation is, of course, often lost, along with sensation for touch, pain, and temperature. Also, in cases of organic disease limited to the motor parts of the spinal cord and in many functional affections, the vibrating sensation and all other forms of sensation are normal at all stages. But with respect to diagnosis, the important point is that loss of the vibrating sensation is frequently one of the earliest signs of sensory affection in certain organic diseases of the spinal cord. At a later date other forms of sensation may be affected; but for a period —in some cases short, in others long—loss of the vibrating sensation may be the only objective sign of sensory affection in many organic diseases. This may occur in compression of the spinal cord from meningeal or vertebral tumour or caries, in some cases of disseminated sclerosis, in cases of combined postero-lateral degeneration of the spinal cord, and in early multiple peripheral neuritis. This isolated loss of the vibrating sensation is of diagnostic value; and from the examination of a large number of cases of organic and functional affections I think we may conclude that in any cases of paresis or paralysis of the legs, if the vibrating sensation is lost whilst other forms of sensation (to touch, pain, and temperature) are felt, and if the patient persists in this statement in spite of suggestions to the contrary, functional affections (hysteria and malingering) are extremely improbable and may be excluded.

In functional cases, if sensation is affected at all, sensation to touch or other forms of sensation are lost along with the loss of the vibrating sensation, or by suggestion, through the wording of the question, the patient will state that they are affected. He will not persist that the vibrating sensation is *alone affected* and that other forms of sensation are felt normally.

In testing the forms of sensation I think it advisable to test touch sensation first and the vibrating sensation last. Also a part where the sensation is expected to be normal should be tested first and the examiner should see that the patient recognizes clearly the difference between touch sensation and the vibrating sensation at this part.

In cases of localized lesions of single peripheral nerves or nerve trunks often sensations to touch, etc., are not affected; in other cases lost; but the vibrating sensation is recognized. In these cases the vibrating sensation is often felt normally; it is sometimes diminished, but I have never found it lost entirely. In this respect such cases differ markedly from *multiple* peripheral neuritis.

The following brief references to cases I have met with in my own practice will indicate the value of certain signs, and especially of the tendo Achillis reflex and of the vibrating sensation, in the early recognition of organic diseases, and in the differential diagnosis from functional affections.

In early cases that at a later period can be clearly diagnosed as the spinal form of disseminated sclerosis, or compression myelitis from vertebral caries, or various forms of spastic paraplegia, for some time paresis of both legs with a Babinski or Oppenheim reflex may be the chief signs and the reflexes just named are the only definite indications that the disease is organic. Occasionally the Babinski reflex is obtained on one side only. If the Babinski reflex cannot be obtained, occasionally the Oppenheim reflex can be detected. Both these reflexes are diagnostic of organic disease. In some of these cases also the vibrating sensation is not felt, whilst other forms of sensation are recognized. This change, if detected, would be an additional definite sign in favour of organic disease.

Cases of peripheral neuritis from alcohol, diabetes, or other causes are occasionally seen at a very early stage, when the knee-jerks are still obtained. The patient complains of weakness and pains in the legs. In such cases the tendo Achillis reflexes are usually lost, and very frequently the vibrating sensation is lost whilst other forms of sensation are felt. Thus we have two definite signs that the affection is not functional.

In chronic anterior poliomyelitis commencing in the legs the Achillis reflex may be lost, though at first the knee-jerk is obtained. In a case of this affection following a very slight injury to one foot the loss of the tendo Achillis reflex enabled me to exclude functional disease or malingering as the cause of the paresis. The knee-jerks were normal in this case and the vibrating sensation and other forms of sensation were felt quite well. The bladder was unaffected, and at first paresis of the muscles of the legs below the knee and loss of the tendo Achillis reflex and feeble or indefinite plantar reflexes were the only signs of the disease. Later the plantar reflexes were lost. In acute anterior poliomyelitis limited to the lower lumbar region we often find the tendo Achillis reflex lost, though the knee-jerks are obtained, and we have thus an important indication in favour of organic disease in the differential diagnosis from functional affections.

In many cases of functional paraplegia, in some cases of hysteria, shell shock, and neurasthenia, the plantar reflexes are lost but all other reflexes normal. This isolated loss of plantar reflex is always in favour of functional disease, and, though not diagnostic, should lead to careful examination for other signs. In any case of paraplegia (or paresis of the legs), if the plantar reflexes are lost and the knee-jerks obtained and ankle clonus not obtained, the tendo Achillis reflex should be carefully examined. The tendo Achillis reflex is always present in functional disease; if lost, organic disease can be diagnosed; if obtained, the case is probably functional though not certainly. The plantar reflexes are normal or increased in other cases of functional paresis or paraplegia, and the other reflexes normal or increased.

In some cases of compression of the spinal cord by a tumour, meningeal or vertebral, or by tumour within the cord, for a period at the onset of the paraplegia (for a few days or longer) the legs may be partially or completely paralysed and yet the reflexes may be all normal and sensation to touch, pain, and temperature normal. Soon changes in the reflexes occur in these cases—Babinski reflex, or ankle clonus, or loss of all the reflexes. But if the case is seen at the early period, when all the reflexes are normal, the diagnosis from functional disease will require very careful consideration. A history of girdle or

* For more detailed description see writer's book, *Diseases of the Spinal Cord*, p. 66. London; 1911.

† The vibrating sensation may be tested by a large vibrating tuning-fork, the foot of which is placed on a subcutaneous bony prominence or bony surface, such as the malleoli, the inner surface of the tibia in the leg, the anterior superior iliac spine, the styloid process of the ulna at the wrist, the sternum, etc. I have found a tuning-fork which is supplied by Messrs. Woolley and Sons, chemists, Victoria Bridge, Manchester, very useful. It is 7½ inches long, and marked A1 440. An oval metal foot-piece is attached to the tuning-fork. A few control observations are desirable to see if the patient clearly recognizes the nature of the sensation before a routine examination is made.

root pains or root symptoms for some time, weeks or months, before the onset of the paraplegia would be in favour of compression by growth and against functional disease. After a time in other cases I have found that though sensation to touch, pain, and temperature have been felt quite well the vibrating sensation has been lost, and if, in spite of suggestions to the contrary, the patient persists in these statements, we have a valuable indication against the diagnosis of functional disease. Later a definite Babinski reflex may be obtained and incontinence of urine may occur; these would be symptoms indicating organic disease.

In a number of cases where the symptoms later have indicated combined postero-lateral degeneration or sclerosis, at the earliest stage the symptoms may be only slight weakness or heaviness in the legs and indefinite and slight unsteadiness in walking, and functional disease has to be considered. In such cases I have found the vibrating sensation lost whilst other forms of sensation are felt. At this stage also only an indefinite and occasional Babinski reflex may be obtained. From the loss of the vibrating sensation without loss of other forms of sensation in these cases I have excluded functional affections and later definite Babinski reflexes, ankle clonus, paresis, ataxia, and the symptoms of postero-lateral degeneration have developed.

Difficulty in differential diagnosis occasionally occurs in cases of paralysis or paresis of the muscles below the knee, of the muscles which dorsiflex the foot (anterior tibial muscles), and of those which plantar-flex the foot. The symptom may be bilateral or unilateral. Various lesions of the cord or peripheral nerves may produce this form of paralysis. Sensation and the bladder and rectum may be unaffected, or sensation may be only slightly affected. The knee-jerks may be obtained; ankle clonus is not obtained, and the plantar reflexes are lost or feeble or indefinite. But usually the tendo Achillis reflex is of diagnostic service. If the tendo Achillis reflex is *lost* the disease is organic. If the disease is functional the tendo Achillis reflex will always be obtained (it might also be obtained in very localized organic lesions). If the anterior tibial muscles only are affected the tendo Achillis reflex may be obtained in organic cases, but in these cases the patient would be able to stand on his toes (with his heels raised from the ground) but not on the heels with toes raised off the ground.

We meet with many cases of functional paresis among soldiers sent home from active service, presenting three pronounced symptoms—rigidity, paresis, and tremor of the legs. Sensation is normal, the reflexes are normal or merely increased, and the bladder and rectum are unaffected. In some of the cases the symptoms have followed an injury and the cases are often incorrectly diagnosed as "spastic paraplegia." Injury and bullet wounds of the cord, pachymeningitis and other organic lesions may cause somewhat similar symptoms. Sustained and marked ankle clonus and rectus clonus would be in favour of organic disease. But they are often absent in the slighter cases of organic disease, and a pseudo-ankle-clonus or pseudo-rectus-clonus may be occasionally obtained in these functional cases, though the clonus is usually less sustained and less marked than in organic disease. Often the "clasp knife" rigidity is of diagnostic service. The rigidity of legs in the extended position at the knee is marked and we have much difficulty in bending the knee at first, but when once it is *very slightly* bent further flexion is easy (as in bending a clasp knife). This form of rigidity would indicate organic disease. Also a Babinski reflex would be definite indication of organic disease.

CONCLUSION.

Certain reflexes are of the greatest service in the differential diagnosis and early recognition of organic disease, and especially valuable in early cases are the Babinski or Oppenheim reflex, and in many cases the loss of the tendo Achillis reflex, since these signs may be detected when other definite changes have not yet occurred.

The chief difficulty occurs when the knee-jerks are not lost, and when ankle clonus, rectus clonus, and clasp knife rigidity are not obtained. In one group of cases the Babinski or Oppenheim reflex is obtained, and this is diagnostic of organic disease. In other cases the plantar reflex is not of the Babinski type, and it may be lost or feeble. In these the loss of the tendo Achillis reflex would be diagnostic of organic disease.

The following are combinations of diagnostic importance, especially at the onset of a number of organic affections.

Paresis with loss of the tendo Achillis reflex, as in early anterior poliemyelitis—chronic, subacute or acute.

Paresis with loss of the plantar reflex and loss of the tendo Achillis reflex (in many organic diseases).

Paresis with double sciatica and loss of the tendo Achillis reflexes, as in early cauda equina lesions.

Paresis with loss of the tendo Achillis reflex, loss of the vibrating sensation, and pains in the legs, as in early peripheral neuritis.

Loss of the vibrating sensation with very slight incoordination and very slight paresis, with or without a Babinski reflex, as in early combined postero-lateral degeneration of the cord.

Paresis, with Babinski reflex (in many organic affections).

Paresis with loss of the vibrating sensation and Babinski reflex (in the early stages of several organic diseases of the cord).

Root pains, or root symptoms, followed after a period of weeks or months by paresis, as in meningeal spinal tumour.

(In all these early combinations the knee-jerks may be obtained.)

When the diagnosis has been especially difficult, or the symptoms slight and indefinite, the three indications of organic disease which I have found of the greatest service in my own practice have been the Babinski or Oppenheim reflex, the loss of the tendo Achillis reflex, and the loss of the vibrating sensation, whilst other forms of sensation are unaffected.

The value of the Babinski reflex is well known, but the cases briefly mentioned and the points emphasized in this article are, I think, sufficient to indicate that in addition to the well known signs in favour of organic affections we have in the loss of the tendo Achillis reflex, or of the vibrating sensation (whilst other forms of sensation are unaffected), two further signs of much service, and deserving of more frequent consideration in the differential diagnosis and early recognition of certain forms of organic nervous disease.

In certain specially difficult cases, when other usual and well known signs are indefinite or cannot be detected, these two signs are often of great diagnostic value.

AN "IN VITRO" METHOD OF DEMONSTRATING THE "RETURN IMMIGRATION" OF LEUCOCYTES IN BLOOD CLOTS AND IN WOUND TISSUES.

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IN articles published in the BRITISH MEDICAL JOURNAL during the last three years[1] I have drawn attention to the phenomenon of the "return immigration" of phagocytes. The main facts established have been: (*a*) The transportation of pigment particles, previously applied to the surface of granulating wounds, by wandering cells to deeper layers of the granulation tissue. In some cases these pigment-laden cells were recovered from the medullary cavity of exposed bone at some distance from the granulating surface of the wound. (*b*) These results in the human subject were confirmed by experiments on animals, which also showed in some cases the paths in the tissues traversed by the wandering phagocytes.

Since, however, the question of the possible transference of the pigment granules by the blood or lymph stream arose in all these cases it became important to control these results in the living subject by experiments on excised portions of living tissue, where the circulatory factors could be excluded. In other words, it became necessary to devise some experimental method whereby the only

factor which could be concerned in the transportation of the pigment granules would be the phagocytes themselves.

Experiment I.

Blood is drawn from the finger into a small-bore glass tube and allowed to clot. After coagulation and contraction the clot, if gently detached, lies in a bath of serum. A few drops of a mixture of finely ground carbon particles suspended in normal saline is now added by a pipette to the serum surrounding the clot. The tube is gently rotated so as to bring the suspended pigment in contact with the whole of the outer surface of the clot. The tube with its contained blood clot floating in a bath of carbonized serum is then incubated. After a few hours, varying from six to twenty-four, the clot is removed from the tube and hardened in 5 per cent. formalin. Sections of the cylindrical clot cut at right angles to its length are then stained with methylene blue or Leishman's stain.

In order, however, to save labour in searching for the leucocytes, it is better to centrifugalize the blood before clotting takes place. We then obtain a cell-free zone above, a red corpuscle zone below, and a leucocyte zone between the two. After contraction of the clot has taken place the pigment mixture is added to the serum, care being taken to bring the pigment in contact with the surface of the clot in the leucocytic zone. Fig. 1 shows

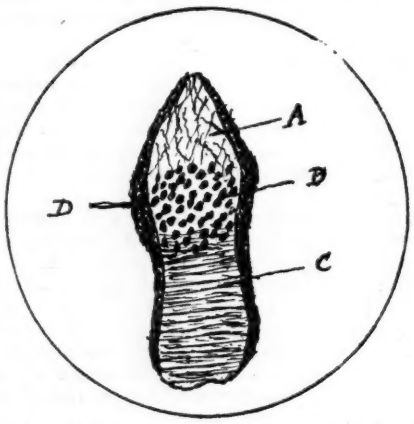

FIG. 1.—Section (semi-diagrammatic) of centrifuged blood clot, after incubation in serum with carbon pigment. A, Cell-free fibrin zone. B, Leucocyte zone. C, Red corpuscle zone. D, Carbon pigment.

the appearance of such a pigment-coated clot. The black coating is especially marked in the leucocytic zone. Fig. 2 shows the appearance of a section cut parallel to the length of the clot. In the upper non-cellular fibrin zone a thin coating of carbon pigment is seen covering the outer surface, but no free pigment in the interior of the clot. In the lower red corpuscle zone the same appearance is seen. In the leucocytic zone, however, not only is the pigment thickly deposited on the surface but pigment granules are found in the interior. With a higher magnification (Fig. 2) these granules will be seen to lie in the interior of leucocytes. Of the number of pigment-containing leucocytes which lie on the surface some will be seen to have passed into the interior of the clot, some have made their way upwards into the cell-free zone, while a smaller number will be found lying amongst the red cells in the red corpuscular zone. Pigment granules are not found lying free in the clot, and those that reach the interior must have been carried there by the return immigration of pigment-laden leucocytes from the surface.

The reason for drawing the blood into a moderate-sized tube in preference to the flat emigration tubes used by Sir A. Wright is in order to secure a copious bath of serum, and to prevent the clot from touching the wall of the tube. Leucocytes which come into contact with and adhere to a foreign body like glass fail to detach themselves and are unable to re-enter the clot. In this experiment the blood was allowed to clot in its own native serum. The contracted clot may, however, be removed from its own serum, and, after gentle washing in normal saline, may be dropped into a tube containing serum from another individual, to which also the carbon pigment has been added. In this way the conditions under which the leucocytes pass to the surface, take up the pigment, and re-enter the clot can be controlled, and the effect of both native and foreign serum on the amoeboid activities of the phagocytes can be compared. Provided that the foreign serum is not toxic to the leucocytes—this fact can be ascertained by incubating a drop of the blood from the individual providing the clot with a drop of serum from the individual supplying the serum in a closed cell, when, if the serum is non-toxic, the leucocytes will emigrate, adhere to the slide, and show the iodophil reaction when stained with iodine—incubation in a foreign serum seems to cause a larger number of pigment-laden cells to re-enter the clot. The effect on return immigration of adding various chemical reagents to the serum can also be observed.

Such are the facts concerning the movements of the leucocytes in an incubated blood clot. This *in vitro* method may also be used for the examination of the movement of the phagocytes in excised portions of different tissues and organs, and especially in the granulation tissue of wounds.

Experiment II.

A wedge-shaped portion of granulation tissue removed during operation from a reamputated stump was placed in a closed cell in normal saline; the free surface was coated with carbon pigment, and the tissue was incubated for a few hours. In another case the granulating surfaces of two

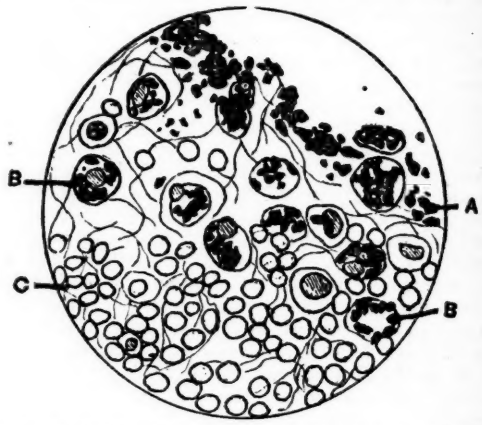

FIG. 2.—Section from blood clot incubated thirty hours in native serum. Shows pigment-laden leucocytes in the fibrin and in the red corpuscle zones. A, Pigment on surface. B, Leucocytes containing pigment. C, Red corpuscles.

portions of tissue previously coated with the carbon pigment were closely applied, and incubated in contact in liquid paraffin. In this way the conditions were reproduced *in vitro* under which secondary closure of a granulating wound is performed, except that the blood and lymph circulatory factors were excluded.

After incubation the tissue was hardened, and sections cut at right angles to the free surface. They show the movements of pigment-loaded leucocytes in a piece of living granulation tissue removed from the circulation and incubated in liquid paraffin. A layer of carbon pigment covers the surface, a large number of the leucocytes on the free surface have taken up the pigment, and of these a certain number will be seen to have travelled from the surface to the deeper layers of the tissue by a process of return immigration. The number of pigment-laden cells found in the tissue will depend, among other things, on the degree of infection—that is, on the healthiness of the wound, and on the density of the tissue to be traversed. These points will be considered later.

Experiment III.

Instead of limiting the inquiry to the activities of the leucocytes already present in or upon the surface of a piece of granulation tissue, we may investigate the same tissue from the point of view of its suitability as an immigration field for wandering white blood cells, both native and foreign.

Some blood from the patient providing the piece of granulation tissue is drawn during operation into a tube, and some of the carbon-mixture pigment added and mixed with the blood. The granulation tissue is then incubated in a closed cell with this carbonized blood, or foreign blood may be used from another individual, or a differ-

entiating method may be employed; thus, the blood, either native or foreign, containing the carbon pigment may be allowed to clot. After coagulation and contraction a disc-shaped section may be cut from the clot 1 or 2 mm. thick. This disc with its contained pigment-laden leucocytes can then be applied to the surface of a piece of granulation tissue, and the two incubated in contact in blood serum in a closed cell. It is not necessary to use the disc of blood clot immediately, for I have ascertained by incubating discs of blood clot in native serum at varying intervals after coagulation that the contained leucocytes will emigrate freely, give the iodophil reaction, and take up pigment particles twenty-four hours and longer after coagulation has occurred.

By using a disc of previously clotted blood the migration of pigment-loaded leucocytes can be concentrated in one area of the granulating surface. Fig. 3 shows a section from granulation tissue incubated in native blood to which carbon pigment has been added before coagulation. The leucocytes loaded with pigment can be seen in the clot surrounding the tissue and numbers of these pigment-laden cells will also be found in the interior of the granulation tissue at a considerable distance from the surface.

The fact that by suitable experiment *in vitro* the return immigration of pigment-laden phagocytes can be demonstrated in granulation tissue in the absence of both the blood and lymph circulations bears on the clinical problem of the influence of sterile and infected blood clots in wounds and the effect of such coagulated blood on the spread of infection.

This *in vitro* method may also be used for investigating different tissues and organs as fields for leucocytic immigration. The relative avidity with which pigment-laden leucocytes enter and re-enter the intercellular spaces of connective and muscular tissues on the one hand and the tissues of organs, such as the spleen or liver, on the other can be ascertained, the disturbing influence of the circulation having been excluded in each case.

Portions of excised living lymph gland have been incubated with this point in view.

FIG. 3.—Granulation tissue, incubated twenty-four hours with "native" blood and carbon pigment. A, Pigment on surface. B, Leucocytes containing pigment.

Experiment IV.

When a portion of lymph gland is incubated with native blood serum to which carbon pigment has been added, although some of the lymph cells lying on the surface or in the reticulated gland tissue emigrate and adhere to the slide, and although a certain number of these cells ingest pigment particles, they are comparatively few in number. A marked contrast is noted between the behaviour of these small lymph gland cells and the more active white blood cells when incubated under like conditions. While the polymorphs and mononuclears emigrate freely from the clot and ingest pigment particles, the lymph cells, on the contrary, are more sluggish; they preserve their circular outline, adhere with difficulty to the slide, and ingest comparatively few pigment granules.

Also, if a portion of the gland be incubated in native blood to which pigment has been previously added, very little emigration of the loaded leucocytes takes place from the blood into the gland tissue.

Fat tissue has also been examined from this point of view. A piece of excised living omentum was incubated in both native and foreign pigmented blood. In this case carmine was the pigment used. A few leucocytes containing carmine were found in the intercellular spaces of the fatty tissue at some distance from the surface. They were most numerous in the perivascular channels.

Return Immigration in Mucous Membranes.

I have also carried out some observations on mucous membranes which point to the occurrence under certain conditions of a "return immigration" of pigment-laden leucocytes from mucous surfaces. These observations are, however, at present incomplete.

The Size of the Pigment Particles as a Factor in Return Immigration.

The size of the pigment masses ingested by the migrating leucocytes considerably affects the capacity of those cells to re-enter the clot or the tissues. This fact no doubt depends on physical conditions. A phagocyte distended by a large rigid mass of carbon is less able to insinuate itself between the cellular obstacles in its path than a cell containing smaller granules. It is thus possible that the size and the rigidity of organisms ingested by wandering cells may affect the movements of the phagocytes which have ingested them. I have tried feeding phagocytes on substances like magnetic iron in order to ascertain whether such substances (with the containing cells) can be drawn into the tissues in greater volume and to a greater distance by magnetic influence, so far, however, without definite result, although the iron particles are ingested by the phagocytes.

The Varieties of Phagocytes Concerned in Return Immigration.

The examination of the incubated blood clot in pigmentary serum affords some evidence of the relative activities of the different varieties of leucocytes in emigration, ingestion, and return immigration. The observations now recorded confirm the facts already known as to the movements of the leucocytes in the living body. While the polymorphs are the most active in these three directions the mononuclears also take a considerable part. The eosinophil cells with large granules rarely seem to ingest pigment particles.

The Factors Determining Return Immigration.

The outward emigration of leucocytes to the surface of the blood clot seems to be a general movement shared in by all kinds of wandering cells. I have been impressed by the great tendency shown by all white blood cells to get clear of the fibrin and red cells after coagulation has taken place in a blood clot. Sir A. Wright has described leucocytic movement as of two kinds: (1) Eleutherotropic or aimless and general, and (2) chemiotropic in a definite direction. The movements of the leucocytes in "return immigration" are more obscure in character. Of the many thousands of white cells which occupy the leucocytic zone of a blood clot incubated in a bath of serum and pigment only comparatively few pigment-laden cells re-enter the substance of the clot. Of these, the greater number pass obliquely upwards from the surface into the cell-free fibrin zone, and only a few pass into the red cell portion of the clot.

This difference may depend partly on physical conditions. The more open spongy network of the fibrin zone may provide the easier route. The important question still remains: What are the factors which determine whether a pigment-loaded phagocyte shall drop off the surface of the clot into the serum or remain attached to the surface, or whether it shall work its way back into the interior of the clot? The causes are probably both intrinsic and extrinsic. The leucocytes differ in age and vigour, and probably in their capacity to respond to environmental stimuli. The condition of the environment, whether the surrounding serum be a native or foreign serum, the presence of chemical reagents in the serum, all these may influence the result. I have already alluded to the importance of preventing the clot from coming in contact with the wall of the tube by the intervention of a sufficient layer of serum. Leucocytes that have attached themselves to foreign substances become damaged, and seem unable to detach themselves completely. They may crawl for a short distance over the glass surface, but (unlike the amoeba, which is accustomed to the outside world) they do not become free again or re-enter the tissues. No doubt the pigment particles present a foreign surface, but, if not too large, these are englobed by the cells, and the continuity of the

protoplasmic surface is restored. This injurious effect of contact with foreign material which cannot be ingested plays an important part in wounds. Living phagocytes which come in contact with a dressing remain adherent to it. Hence the injury produced by frequently removed dressings in a healing granulating wound.

The Influence of Infection on Return Immigration.

In the living body the return immigration of wandering cells is complicated by the presence of a blood and lymph circulation, but here also the pigment-laden cells which re-enter the tissues are comparatively few in number and the inward flow is frequently limited to definite areas on the granulating surface.

Organisms are present in few or in large numbers in or on the granulation tissue of practically all open wounds. This also will influence the movements of the leucocytes, because where organisms are present in large numbers there large numbers of the emigrating cells also perish and are thrown off as pus cells, much tryptic digestion goes on, and few phagocytes survive and return to the tissues.

The complicating element of the organisms and their toxins is, however, eliminated in the case of a blood clot incubated in pigmented serum under aseptic conditions. Here, therefore, we find that a larger proportion of cells take up the return journey. In general terms the relative number of phagocytes which re-enter the tissues after emigration on to the surface of a granulating wound depends largely on the virulence of the infective process, or in other words on the efficiency of the defensive mechanism, that is on the healthiness of the wound.

If the surface of a piece of granulation tissue excised from a moderately infected wound be washed in normal saline and then incubated for a few hours, careful examination with the lens will show collections of pus cells at certain points on the surface. Suppuration, in fact, continues during incubation in the absence of a blood and lymph circulation. Under these conditions, however, there is no uniform secretion of pus over the whole surface. The leucocytes emigrate in certain areas, partly determined by the presence of organisms and partly by ease of transit. In the same way the pigment-laden phagocytes, or as many of them as are not thrown off as dead pus cells, re-enter the tissues in certain areas also.

The Effect of Chemical Reagents on Return Immigration.

The effect of different reagents applied to the surface of the incubated tissue or blood clot during incubation varies considerably, and requires further investigation by the *in vitro* method. A coating of liquid paraffin, or the immersion of the tissue in a bath of liquid paraffin during incubation gives better results than normal saline as far as the activities of leucocytes are concerned. Fewer cells are thrown off as pus cells, a larger number take up the pigment and re-enter the tissues. Gum solutions act somewhat in the same way, but less favourably. These inert substances seem to favour return immigration more than the active antiseptics. I hope to record further observations on the effect of liquid paraffin on the movements of leucocytes later.

The Ultimate Fate of the Phagocytes which Re-enter the Tissues.

In the BRITISH MEDICAL JOURNAL, December 23rd, 1916, I suggested that pigment-laden phagocytes may under certain conditions discharge their pigment loads (possibly by the cytolysis of the cells) and that the pigment granules so liberated may be taken up by the fibroblasts, endothelial and other connective tissue cells. Careful examination of a blood clot in which return immigration of pigment-laden leucocytes is going on will sometimes show little collections of pigment grains lying free in the fibrin network, as though liberated by some cell which had undergone cytolysis. The blood clot, however, contains no tissue cells capable of taking up the liberated pigment. In granulation tissue, on the other hand, pigment granules may sometimes be observed in cells which look like connective tissue cells at some distance from the surface. Since the blood and lymph circulation is absent these carbon granules must have been carried to these situations by wandering cells. These facts bear on the problem of the spread and the recrudescence of infection, and on the mode of action of the defensive mechanism.

The Importance of the Problem.

Having now shown that a process of "return immigration" of pigment-laden phagocytes occurs under certain conditions in wounds, and probably also on free mucous surfaces, the next step is to show that phagocytes containing ingested organisms behave in the same manner.

If this occurs, as we have every reason to believe, then the importance of the "return immigration" of phagocytes becomes at once apparent. Evidence accumulates (see observations by Peyton and Rous, Kyes, Bull, and others) which tends to show that pathogenic organisms when ingested by phagocytes are not always killed by intracellular digestion. I have previously (see BRITISH MEDICAL JOURNAL, December 23rd, 1916) drawn attention to the association between the spread of infection in certain diseases, the recrudescence of local sepsis in wounds, and the return immigration of phagocytes. The fact now established that return immigration can take place apart from the blood or lymph circulation affords further corroboration of this view.

REFERENCE.

[1] BRITISH MEDICAL JOURNAL, June 3rd, 1916; December 23rd, 1916; February 3rd, 1917.

MUSCULO-SPIRAL NERVE DISABILITIES.

BY

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AND

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As many and various appliances are now in use for cases of wrist-drop, each presumably with the object of ensuring "complete and continuous relaxation of all the affected muscles over long periods," it seems desirable that precise and definite information should be obtained, anatomically as well as clinically, of the value of the various positions in which the hand is retained by the apparatus.

The positions met with among soldiers and pensioners with this disability may be classified into the six shown in these sketches:

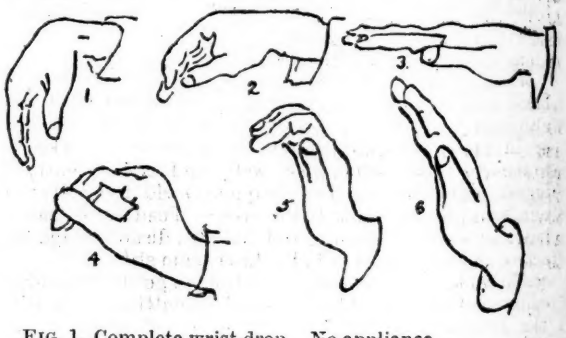

FIG. 1. Complete wrist-drop. No appliance.
FIG. 2. Flat straight splint extending to the palm of hand.
FIG. 3. Flat splint to finger tips. Generally not including thumb.
FIG. 4. Small metal "cock up" splint. (Fingers and thumb free for use.)
FIG. 5. Long "cock up," to support first phalanges, often also thumb.
FIG. 6. Extra long, which supports terminal phalanges and also thumb.

To test these positions anatomically in relation to each individual "muscle relaxation," we have made observations and measurements on adult male cadavera.

The procedure we adopted to estimate quantitatively the amount of "muscle relaxation" in each muscle affected by musculo-spiral disability was:

1. The tendons and muscle bodies on the dorsum of the forearm were exposed and differentiated.
2. A narrow band of annular ligament was left *in situ* to form a "fixed point."
3. The hand was placed in complete wrist-drop (Fig. 1), and in this position a small stitch was placed

through each tendon under the fixed point, to give the "moving point."

4. Measurement was made, in millimetres, of the distance the "moving point" could be retracted from the "fixed point"—no force being used—in each position of the hand. This gives the average "muscle relaxation" value for each muscle shown in the following table:

Muscle Relaxation Length (in mm.).

	Position—				
	2	3	4	5	6
Ext. carpi radialis longior	6	6	25	25	25
Ext. carpi radialis brevis	13	13	28	28	28
Ext. carpi ulnaris	3	3	6	6	6
Ext. communis digitorum, including ext. indicis and ext. minimi digiti	3	15	15	28	28
Ext. longus pollicis	0	6	13	32	32
Ext. ossis metacarpi pollicis and ext. brevis pollicis	0	0	0	0	0

It will be noticed that muscle relaxation is not promoted in extensor ossis metacarpi pollicis or extensor brevis pollicis by any of these positions. To provide this it would be necessary to abduct the hand at the same time as the thumb was extended. As abduction of the hand can only take place to any extent when the hand is in position 3, there are great difficulties in providing muscle relaxation in these muscles.

Taking the positions seriatim—

Position 1 is totally bad; such neglected cases should not be met with, and should not be allowed to remain so when discovered.

Positions 2 and 3 (the straight splint series) provide only a small percentage (25 to 50) of the total muscle relaxation possible, and are therefore indequate.

Position 4: The splints maintaining this are the small "cock up," usually metal, and therefore light and easy to wear, and are comfortable to sleep in. They are not disliked by patients who can do remedial work and exercises in them. We have noticed in these cases that the wrist extensors nearly always appear to show improvement before the long extensors of the fingers; this is probably accounted for by the facts as shown in the table, that the former are approximately in position of 100 per cent. of muscle relaxation, whereas the latter have only approximately 50 per cent. muscle relaxation.

Positions 5 and 6, which provide equally well the total muscle relaxation possible, are very infrequently adopted for any long period. They can be obtained only by broad and cumbersome splints, which the patients find irksome, particularly when otherwise well, and consequently, if they are out-patients, they frequently rid themselves of the apparatus between their visits. Position 6 has no advantage over position 5, and has the disadvantage that the phalangeal joints are liable to become stiff.

We have found that cases which have got to a standstill in position 4 have rapidly improved by putting them up for a limited period in position 5, and as there seems valid reason for this, the importance of this line of treatment should not be lost sight of, for 100 per cent. greater muscle relaxation is obtained for the long common extensor, and also for the long thumb extensor, by this means.

To sum up: position 4 seems to offer the most all-round advantage as a daytime position for prolonged treatment with occasional temporary resort to position 5 for a limited time; if the value is plainly stated to the patient and he is willing to put up with the disadvantages of it, he should adopt position 5 when sleeping, and so gain advantages for the long extensors.

THE United States Public Health Service offers anti-typhoid inoculation free of charge to all who apply to any of its hospitals or field offices. Many of these offices are in zones surrounding military cantonments, and stress is laid on the fact that the prevention of typhoid fever in these zones is one of the most important means of preventing the interchange of the disease between the military and the civil population.

AN EPIDEMIC OF FIFTY CASES OF INFLUENZA AMONG THE PERSONNEL OF A BASE HOSPITAL, B.E.F., FRANCE.

BY

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FOR the medical details in the following report I am indebted to my comrades Major T. J. T. McHattie, R.A.M.C.(T.), and Major F. S. Jackson, R.A.M.C.(T.).

EPIDEMIOLOGY.

On June 15th, 1918, in the afternoon, twenty orderlies reported sick with fever, headache, and backache. During the following three days, 5, 10, and 6 similar cases respectively occurred, including the staff of the pathological laboratory (who had been taking blood cultures from the patients), all the servants of the officers' mess, seven medical officers, and four sisters, three of whom had nursed some of the earlier cases.

Three further cases occurred amongst the sisters during the next few days. Finally, the sister who had charge of the sick nurses fell a victim, and the epidemic terminated.

SYMPTOMS.

In every case there was headache, backache, and general malaise. The temperature reached 102° F. on the first or second evening, and in one case rose to 104° F. The duration of the fever was—

In 1 case ...	... 7 days	In 26 cases...	... 3 days
In 2 cases	... 6 ,,	In 7 ,, ...	... 2 ,,
In 3 ,, ...	... 5 ,,	In 5 ,, ...	... 1 day
In 6 ,, ...	... 4 ,,		

Pain in the back of the eyes and some tenderness of the globe was general. The eyes were suffused in 14 cases, photophobia was present in 5. In 4 cases there was vomiting during the first day, and this was accompanied by diarrhoea in one instance. A feeling of rawness over the trachea was commonly experienced. An irritating cough occurred in 25 cases. There was little or no expectoration, as a rule, during the first few days, and when any sputum was obtained, it was composed of thin, frothy mucus. In most cases the cough disappeared with the fall of temperature, but in 12 instances it persisted with muco-purulent expectorations for some days.

CONVALESCENCE.

The temperature generally fell quickly to normal, or nearly normal, but it was not unusual for a subsequent rise to 99° to 100° F. to occur next day for a few hours, after which it remained normal. Patients were allowed up on the second day on which the temperature remained normal, and generally expressed themselves as fit for work on the following day. In cases in which the fever lasted for five days or upwards, and in two in which a cough persisted for a week or more after the fall of temperature, convalescence was delayed.

BACTERIOLOGICAL INVESTIGATIONS.

A. *Blood Culture.*

Ten c.cm. of blood was drawn into 70 c.cm. citrated broth during the acute stage of the illness (first or second day) from twenty-four patients. Apart from a few instances in which contamination had occurred, the flasks remained sterile.

B. *Investigation of Sputa.*

This was undertaken in twenty patients. In the early stage of the illness few of the men could produce sputum suitable for investigation. Although many had a worrying cough, the amount of expectoration that came from the trachea was minimal. It was generally thin clear mucus full of bubbles, and its contents indicated that most of it was derived from the back of the throat. It was full of microbes of all sorts, and I rarely succeeded in recovering anything resembling the influenza bacillus from it. As muco-purulent tracheal expectoration became increasingly available I was more successful, and the following observations refer more particularly to the sputum of this kind

1. *Observations upon Stained Films.*

In the tracheal mucus from eight patients during the first or second day of disease occasional groups of Gram-negative bacilli resembling *B. influenzae* were seen, and in similar material from three patients these were present in considerable numbers. The total number of organisms of all kinds was small, the prevailing microbes being staphylococci, pneumococci, or Gram-negative micrococci. As the sputum later became increasingly purulent, the influenza-like bacilli increased greatly in number and in proportion to other microbes. In some cases in which the cough persisted they occurred in immense numbers to the practical exclusion of all other organisms. The bacilli were pleomorphic. Their size varied from 0.5 to 1.2 μ in length and 0.3 to 0.6 μ in breadth. Many were almost square; coccal and diplococcal forms 0.37 by 0.3 μ were numerous.

2. *Cultivation upon Blood Agar.*

Usually the total numbers of colonies which grew upon blood-agar plates implanted from a washed piece of tracheal mucus was small. From the sputum of fourteen patients (that is, nearly three-fourths of those examined) on the plate taken at some period of the disease, minute colonies of small Gram-negative bacilli were obtained. In five instances such colonies were very abundant.

In the primary culture from the sputum the colonies, after twenty-four hours' incubation, were from 0.1 to 0.2 mm. in diameter, hemispherical in shape, and quite clear. Those colonies which had developed in the neighbourhood of staphylococci or pneumococci were larger than the average. On subculture upon blood agar they grew well, the colonies increasing in size with each successive subculture until, in the case of some strains, they obtained a diameter of 0.5 to 1 mm. after twenty-four hours' incubation. They failed to grow, when subcultured, upon nutrient agar or serum agar, or inspissated egg-yolk media.

The bacilli were larger in cultures than they were in the original sputum, varying in dimensions from 1.5 μ by 0.5 μ to 0.6 μ by 0.4 μ. Some colonies exhibited some involution forms usually 5 μ to 6 μ in length, but sometimes as long as 20 μ.

Persistence of the Influenza-like Bacilli in the Respiratory Passages.

From one case, in which cough with expectoration of purulent mucus persisted for upwards of a fortnight after the temperature had reached normal, sputum teeming with organisms indistinguishable from *Bacillus influenzae* Pfeiffer was ejected each day.

There were very few other organisms to be seen or grown from this sputum. For the first ten days the organisms were not seen inside the leucocytes, but from that date onwards the numbers of polymorphonucleated leucocytes which contained these rapidly increased. Coincident with this increase in phagocytic activity a marked improvement was noticed in the patient's condition. The cough became less troublesome, the sputum more purulent but diminished in amount, and "slackness," which had been a marked feature, soon disappeared. In two other cases in which persistence of infection was observed the patients had been admitted on suspicion of having one of the enteric fevers. Both had some bronchitis, and the sputum contained influenza-like organisms in countless numbers. The sputum smeared over plates of blood agar afforded each day nearly pure cultures of bacilli indistinguishable from *B. influenzae*.

In these two cases also phagocytosis of the bacilli was not observed until the twelfth and eighteenth day respectively, and was coincident with a marked improvement in the pathological condition.

The fourth case was observed by accident. The patient was convalescent from cerebro-spinal fever and cultivations were made at intervals from his nasopharynx to exclude the presence of meningococci prior to discharge from hospital. On the serum-glucose-agar plate a number of colonies grew which possessed all the characters of *Bacillus influenzae*. In this case they had grown direct from the throat mucus without the assistance of blood, but in subculture they only grew on blood-agar. On inquiry it was found that the patient had suffered from a sore throat and fever for three days a fortnight previously when the epidemic was affecting the hospital staff. The bacilli were still present in the nasopharynx two weeks later.

Leucocyte Count.

Total and differential enumeration of the leucocytes in the blood was made in five cases. The total number varied from 8,000 to 12,000 per c.mm. and the distribution of the different varieties was within normal limits.

Agglutination of Patient's Serum.

The serums of five patients who had had a severe attack were tested fourteen days after they were taken ill for the presence of agglutinins for the bacilli isolated from the sputa. The highest agglutination titre, by naked-eye method, reached was only 1 in 40, and in two control serums it was 1 in 20. There was not a significant increase—a result which I believe is consistent with previous experience of influenza.

CONCLUSION.

There appears to me no doubt that the outbreak described above was an epidemic of influenza.

It was associated with the presence of haemophilic bacilli in the respiratory passages. The bacilli possessed all the characters of Pfeiffer's *B. influenzae*, but in the absence of any specific tests for this bacillus, identity cannot be established.

THREE CASES IN WHICH LAMINECTOMY FOR THE REMOVAL OF SHELL FRAGMENTS FROM THE SPINAL CANAL WAS PERFORMED.

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THE following three cases are published as they exemplify a condition which is relatively uncommon among the spinal injuries of war, and not because there is anything remarkable in them *per se*.

In each case the missile was a shell fragment with particles of clothing attached to it. In each it had caused some destruction of the bony covering of the canal, had opened the spinal dura, leading to the free escape of cerebro-spinal fluid when the opening was exposed, and was lodged partially or wholly in the spinal canal. In all cases the clinical evidence went to show that the spinal cord was not divided, thereby rendering the prognosis much more hopeful than is ordinarily the case.

CASE I.

Pte. P. (December, 1917). His story was that a shell burst close behind him, and that complete loss of power in the lower limbs followed immediately on the receipt of the injury. On admission to a casualty clearing station he was crying out because of intense pain in both legs.

There was a small wound of the back an inch and a half to the left of the mid-line, at the level of the third lumbar vertebra. The legs were completely paralysed, except that there was slight movement of the toes. There was inability to pass urine, which was drawn off by catheter and was normal. The chief alteration of sensation was intense hyperaesthesia of the legs and feet, so marked that the weight of the blankets could not be tolerated; indeed, while being *x*-rayed, he insisted that if anything touched his feet he would not hold himself responsible for breaking the machine. *X* ray showed a small foreign body, dead in the middle line, opposite the body of the first lumbar vertebra, and situated two and three-quarter inches from the skin (Captain Eustace).

Operation.

The entrance wound and track in the erector spinae were excised twenty-four hours after being wounded. The track led upwards and inwards to the left lamina of the second lumbar vertebra, which was fractured, the missile entering the vertebral canal through the upper part of it. Laminectomy was proceeded with as follows: Starting from the excised wound and extending upwards and downwards, a flap of skin was marked out, reaching from the last dorsal to the fourth lumbar spine, with its convexity to the left, the limbs of the crescent passing about one inch across the mid-line. The flap of skin and subcutaneous tissue was turned back. The erector spinae was separated on either side from the last dorsal and upper three lumbar vertebrae by vertical incision in the mid-line, followed by the free use of a rugine, haemorrhage being controlled by hot saline pack on one side while the other was being dealt with. The spines were nipped off by laminectomy forceps, and the laminae of the second and first lumbar vertebrae removed by ordinary skull nibblers, bleeding here again being controlled by pressure. A free exposure of the spinal

canal was thus obtained, and a small vertical slit in the dura mater showed where the missile had entered. There was a considerable escape of cerebro-spinal fluid. The dura was incised in an upward direction from this slit and the foreign body, a piece of copper driving band, half an inch by a quarter of an inch, was found embedded superficially in the spinal cord, about half an inch above its termination. It was removed, together with some fragments of cloth, the wound in the cord being bipped, and the canal sutured with fine catgut. The rest of the operation area, with the track in the erector spinae, was then bipped and the whole completely sutured, with catgut for the muscles and silkworm gut for the skin.

After-History.

The patient was retained in hospital ten days. The excessive pain and hyperaesthesia were much improved the following day, and disappeared very quickly. By the third day he was able to flex both knees and hips, and the power in his limbs increased up to the time of his evacuation. A catheter was passed night and morning at first, and the bladder washed out with boric lotion. On the fourth day he micturated himself, but for the next two days required a catheter again. From the seventh day he micturated regularly, and completely emptied his bladder. The wound had healed completely before his evacuation to the base, and his general condition was very satisfactory.

CASE II.

Pte. N., stretcher-bearer was admitted (April, 1918) with a wound of the back, about 2 in. to the left of the middle line, and opposite to the fifth lumbar spine. His chief complaint was of pain down the left leg, like sciatica, aggravated by the weight of the clothes. There was loss of power in the leg, though it was not completely paralysed, the movements being limited and weak. The right leg was much less affected. He said he had tried to pass urine and had failed, and there was a feeling of numbness in the penis. *X* rays were not available. A catheter was passed and normal urine withdrawn.

Operation.

About eighteen hours after being wounded the wound and damaged erector spinae were excised, and the track found to lead into the vertebral canal on the left side between the laminae of the fourth and fifth lumbar vertebrae, with fracture of the fourth. On introducing the beak of an artery clip along the track into the canal, it came into contact with the missile, the characteristic metallic sound being elicited. An attempt to extract the fragment resulted in its being pushed further up the canal, the manipulations being accompanied by contractions of the limb muscles. Laminectomy was proceeded with as in Case I, the skin flap being turned over to the right side, and the third, fourth, and fifth lumbar spines snipped off by nibblers. The foreign body, which was a piece of shell the size of a hazel nut, could not be removed till the laminae of the third as well of those of the fourth lumbar vertebrae were partially nibbled away. The fragment, which had particles of clothing attached to it, appeared to fill the canal, and there was considerable damage to the nerves in the cauda equina. The hole in the dura mater was quite ragged and there was considerable escape of cerebro-spinal fluid. The hole was not sutured. The whole operation area and track were bipped and completely closed, with catgut for the muscles and silkworm gut for the skin.

After-History.

On account of pressure the patient was only retained in hospital for six days. After the operation temperature and pulse were normal, and, apart from what he called a "chronic dyspepsia" his general condition was quite good. A catheter was passed night and morning and the bladder washed out. He complained of numbness in the left leg rather than pain, though he continued to have some of the "sciatic pains," which diminished in severity with time. In addition to the leg, he complained of numbness of the penis. The loss of power and the movements in the legs were about the same as before the operation. At the time of his evacuation to the base the wound looked quite well.

CASE III.

Bombdr. B. was admitted (June, 1918) with multiple wounds. His story was that he lost the power of his legs at the moment of being hit, and at the same time he experienced severe pain shooting down the legs, especially the left. Since being wounded, in addition to the pain, he complained of a feeling of "pins and needles," referred to the left leg particularly, as well as numbness and loss of power. The movements in the left leg were very slight, but quite good in the right. He had experienced no difficulty with his urine. His injuries consisted of:

1. A penetrating wound on the back of the left wrist.
2. Entrance and exit wounds of the left side of the scrotum, with a large haematoma.
3. A large dirty tangential wound on the inner side of the left thigh, close to the fork.
4. Entrance and exit wounds of the left buttock, superficial.
5. A small penetrating wound of the back 1 inch to the right of the middle line, at the level of the fourth lumbar spine, associated with considerable swelling.

Operation.

He was operated on about twelve hours after being wounded.

1. The wound over the back of the left wrist was excised, and a large piece of shell was found embedded in the lower end of the radius. It was removed, and the hole in the bone scraped and cleaned. The track was then bipped and left open.
2. The entrance and exit wounds of the scrotum were excised, and much blood clot evacuated. The testicle was found to be destroyed; it was removed. The wounds were bipped and sutured up completely.
3. The thigh wound was excised and sutured completely.
4. The entrance and exit wounds of the buttock were excised, and the track cleaned and bipped. It was left open.
5. The small entrance wound of the back was excised. The track extended inwards, fracturing the spine of the fourth lumbar vertebra and passing across the middle line. It continued between the laminae of the third and fourth lumbar vertebrae into the vertebral canal, chipping the lamina of the third *en route*. On passing the beak of an artery clip into the canal the metal foreign body was struck, but it could not be gripped. Laminectomy was proceeded with as in the other cases, the skin flap being turned over to the left side. The spines of the second, third, and fourth lumbar vertebrae were removed, and the laminae of the third only. The missile had passed through the left side of the canal, and at the time of operating was half in the spinal canal and half impacted in the back of the body of the third lumbar vertebra. It was removed, together with some shreds of cloth, and turned out to be a shell fragment ½ in. by ¼ in. There was the usual escape of cerebro-spinal fluid. The hole in the vertebral body was scraped with a spoon and cleaned. No serious damage to the cauda equina was noted. The whole area was bipped and completely sutured, with catgut for the muscles and silkworm gut for the skin.

After-History.

The patient was retained at the casualty clearing station for twelve days.

1. The wrist did quite well, and, as there was no inflammation, it was sutured up on the ninth day.
2. The scrotal wounds healed by first intention.
3. The thigh wound was slightly moist from repeated fouling, but no stitches had to be removed and it did very well.
4. The entrance and exit wounds of the buttock remained quite clean, and both apertures were sutured on the ninth day.
5. The spine incision healed completely by first intention.

The patient had no trouble with micturition from the beginning. Pain gradually diminished in the limbs, and sensation and power improved. He described himself as being "ready for anything" when he was evacuated.

Apart from the complications arising from the nervous injury, those that may be expected in cases of this nature are the same as in other injuries. Haemorrhage, which may be considerable both from the muscle detachment and the bone removal, is controlled, as has been mentioned, by hot packs and pressure, and, as in head cases, the application of bipp to the cut bone surface has been found to be of assistance.

Sepsis may lead to a spinal meningitis, but, in addition, prolonged catheterization is very liable to end in infection of the urinary passages, with serious results. At the same time, in cases like those here recorded, where probably it is a question of a few days only before micturition is re-established, one is loath to do suprapubic cystostomy. (The risk of this infection ceases with the re-establishment of micturition.) Unfortunately no report of Case II after his evacuation is to hand from the casualty clearing station, though one was asked for.

No shock was observed in any of the cases, and they were well from the first.

These are essentially the class of case in which *x* rays are of the greatest assistance, but they were only available in the first. Fortunately in the other two the missile could be actually felt in the canal on passing the beak of an artery clip along the track.

NOTE.—In a letter from England from Bombdr. B. (Case III) dated August 6th he says he is "out of bed for the first time." From it I judge his recovery was uninterrupted.

THE VALUE OF FLAVINE.

A CLINICAL APPRECIATION.

BY

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CASUALTY surgical practice always affords a large proportion of septic injuries which, although "minor" from the point of view of the operating surgeon, nevertheless are extremely disabling to the patient for the time being, and, as in the case of finger lesions, may result in permanent impairment in the earning capacity of an artisan. Therefore I have devoted much attention to the treatment of these cases with flavine. The observations were almost

entirely clinical, but in a few cases I was able to compare the numbers of organisms before and after the application of flavine by taking frequent cultures, as well as by microscopic examination. The results obtained in these seemed disappointing at first, because I often found very little difference in the rapidity of growth or number of colonies before and after treatment and in cases treated otherwise, but I almost invariably found that, whereas in those cases not treated with flavine there was usually a considerable amount of local inflammation, lymphangitis, enlarged glands, and high temperature, and that repeated incisions and removal of tissue (all most vexatious to the patient) were required before a cure was obtained, on the other hand, in cases treated with flavine I have come to regard the absence or marked decrease of constitutional symptoms as the rule. Further, if these local or general symptoms pointing to active infection are present, flavine properly applied has actually worked wonders in bringing about rapid improvement.

The application of flavine should be very carefully attended to. I have known several workers who condemned it, but upon inquiring into their methods it was clear that their results were undoubtedly due to improper use of the antiseptic. For instance, it is not uncommon to hear that cases have been treated for days or weeks with flavine and, except for an initial good effect, the condition has not improved at all. This is very true, but it is due to failure to make use of the valuable properties of flavine. In my experience, which entirely corroborates that of Drummond and McNee[1] and Carslaw and Templeton,[2] it is the early effect of flavine, which follows within several days after its application, that is the most important feature; the great advantage to be gained from its use at this stage does not seem to be sufficiently recognized.

A few essential facts must be borne in mind for the use of flavine: (1) In the first place it is imperative that all affected parts should be reached as far as possible, and in order to carry this out thoroughly I always endeavour to introduce flavine solution by means of a hypodermic or dental syringe. (2) The flavine-soaked gauze should always be applied as wet as possible and any cavities filled up with the solution immediately before, and the part covered with a piece of mackintosh and wool. (3) A third important feature is the duration of the use of flavine; if applied continuously, a yellowish "pellicle" will appear on the surface of the wound in the course of a few days. This pellicle appears to be composed of leucocytes and fibrin. It is noteworthy that in several cases I have observed that the pellicle failed to appear when using flavine in double saline solution (that is, 1.7 per cent. NaCl) instead of the usual normal saline. It is not well to use this solution over prolonged periods, however, because it seems to predispose to irritation of the skin and the appearance of a rash.

I have been led to conclude that the best results from flavine have been obtained from its early application and that the appearance of the pellicle is an indication that a change should be made—for example, to eusol, brilliant green, or magnesium sulphate—on the fourth day or thereabouts and then to revert to flavine once in every three days. This method has given me great satisfaction. It is clear that an enormous amount of sepsis would be prevented by the primary use of flavine, and therefore its use is to be advocated in every case septic or likely to become septic.

The use of the hypodermic syringe has been mentioned above. One of the best conditions to demonstrate the procedure is the common whitlow; after incision, the needle is inserted well down into the tissues a short distance proximal to the lesion and inclined towards it; it will then be found that on emptying the syringe the fluid exudes from the incision and thoroughly irrigates the infected base. It may be necessary to inject in two or more places in order to get a satisfactory irrigation of all parts, and it has been found advantageous that some of the fluid should infiltrate the tissues. By this method it has been possible almost entirely to do away with the practice of fomentations and baths. Admittedly the initial treatment is somewhat more painful than putting on a fomentation, and so it is advisable to use a dental syringe with its fine needle. In spite of the initial discomfort many of my patients have remarked on the rapidity of healing. In this connexion the use of flavine which I have practised in the treatment of lymphangitis and enlarged and painful glands is worthy of note. Although in most cases efficient treatment of the primary lesion speedily causes relief of this condition, in severe cases, seen for the first time after lymphangitis and lymphadenitis have developed, 10 to 20 minims of flavine (1 in 1,000) have usually been injected into two or three places along the tract of lymphangitis after treating the primary lesion; the results have been excellent. I have also found that 1 in 1,000 flavine solution may be safely introduced into the abdominal cavity in cases of appendix abscess, gastric perforation, etc., a quantity being left in the peritoneum after the completion of the operation. I should like to emphasize the value of this procedure, as I am convinced of its advantages. For general use the most efficient preparation has been found to be acriflavine 1 in 1,000 in normal saline.

REFERENCES.
[1] *Lancet*, October 27th, 1917. [2] Ibid., May 4th, 1918.

EXTENSION APPARATUS FOR FRACTURE OF THE FEMUR.

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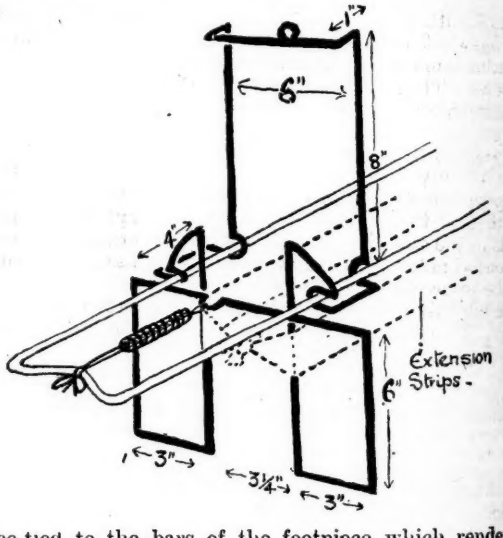
MANY cases of fracture of the femur arrive at base hospitals without extension which extends. The surgeon at the casualty clearing station may have applied a good extension and seen to it that sufficient pull was applied. When the case left his hands the extension strips were exerting traction, but there are several reasons why the case may arrive at the base without extension—the extension strips stretch, the ring of a Thomas splint settles into the buttock, and no provision has been made for these factors.

The trouble lies in the footpiece. There are many—far too many—in use, and each has some single virtue. None perform all the functions required, so that a surgeon must choose which function is most important and use that footpiece.

The footpiece I have devised combines the important features of practically each of the old models and has the additional advantage of allowing the leg to be slung below the level of the bars of the splint. The extension strips



can be tied to the bars of the footpiece which render a spreader unnecessary, since these are just wide enough apart to clear the malleoli and not so wide as to produce anterior-posterior cutting about the ankle.

To compensate for the loosening of the extension, a spiral spring may be hooked to the cross-bar of the footpiece provided for the purpose. By tying the distal end of the spring to the end of the splint, extension is produced which acts through the spring. The spring is such that 20 lb. pull will stretch it 1½ in., that is, 7 lb. per ½ in. Then the extension may loosen 1½ in. before it becomes loose. This obviates the necessity for watching the tension of extension strips. An advantage of the spring is that as the fracture stretches out the pull automatically

decreases. If the spring is set primarily at 20 lb. (with 1½ in. leeway) a stretching of 1 in. will leave the spring with ½ in. leeway and a pull of 7 lb. The spring may have a dial inside its coils reading in pounds and inches.

Lately we have been using an extension applied with a cold glue composed of two parts mastisol and one part Canada balsam. The extension proper consists of a length of cotton stockinette, such as is ordinarily used by American orthopaedic surgeons in applying plaster casts. It comes in 25 yard rolls, and is circular, with a breadth of 4 in. The required length is cut off from the roll and rolled on itself, so as to make a garter-like circle. This is slipped over the foot, the leg is then painted in sections with the glue, and the stockinette is unrolled on to it, all the stretch being taken out during the unrolling. A roller bandage is then temporarily bound around it. The strip overhanging the foot, which is purposely left, is then split front and back and tied to the bars of the footpiece, from which the pull is taken at once. The foot is supported by glueing a piece of stockinette to the sole and suspending it from the footpiece.

If there are wounds of the lower leg, windows can be cut in the stockinette. There is seldom blistering, due to the fact that stockinette takes the pull evenly from every part of the skin, but care must be taken that the glue is not acid, or blistering may occur. Stockinette applied in this way does not slip as adhesive plaster does, and will hold a 20 lb. weight.

With this apparatus applied at the time of the first operation at the casualty clearing station a patient can travel comfortably, and arrive at a base with efficient extension and considerable reduction of the fracture. Incidentally this means immobility and the resultant good effect on sepsis and prevention of shock.

These appliances are all cheap, simple, and of wide application, and, except for the stockinette, can be used again and again.

SOME OBSERVATIONS ON SIX CASES OF RUPTURED SPLEEN.

BY

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WHILE with this casualty clearing station in Macedonia a somewhat remarkable series of accidental abdominal injuries came in for treatment within the space of a few months. They comprise the following cases of rupture of the organ mentioned: Kidney, 2 (both recovered); duodenum, 1 (recovered); small intestine, 1 (died); omentum, 3 (of whom 2 recovered and 1 died); spleen, 6 (all recovered).

It is only with the cases of ruptured spleen that I propose to deal, as the others are familiar injuries, while injuries of the spleen are not usual except where malaria adds to the size and vulnerability of the organ, and further extended notes of the individual cases have been omitted in the interests of paper saving.

In all this series the amount of violence was considerable, although rupture of the spleen may occur from slight injuries, and sometimes even spontaneously. In three cases the injury was a kick by a mule, in one a charge at football, one man fell across a trench, and in the next the injury was a bullet wound.

Condition of the Patient after the Injury.

Immediately after the injury the patient suffers violent abdominal pain and is collapsed, and may vomit or faint. An improvement in the general condition is observed in about an hour; this is followed by exacerbation of the pain and the signs and symptoms of progressive internal haemorrhage. Generally speaking, the gravity of the condition increases proportionately to the interval which elapses between the injury and the time of observation, but is modified in individual cases by the rate of haemorrhage, the external temperature, and the pain and suffering involved in transport over rough country. The administration of morphine greatly lessens the suffering and shock due to transportation, and consequently patients who have received an injection arrive in better condition than those who have not. The shortest time which elapsed between injury and operation was two and a half hours and the longest twenty-four hours.

Diagnosis.

The condition presents all the usual signs and symptoms of a grave abdominal injury, accompanied to a greater or less degree with those of internal haemorrhage. The pain, which may not be excessive as the patient lies quietly, is rendered extremely violent on movement, and particularly on coughing or deep breathing. In a case of left-sided abdominal injury in a malarial country the organ probably involved is the spleen. The history of the injury and sometimes the mark of the bruise confines the possible injuries to the left side of the abdomen—that is, kidney, intestine, omenta, and spleen. The question whether the kidney is involved is easily decided by the presence or absence of blood in the urine. If the liver dullness is present the omentum or spleen will be involved—that is, a case of haemorrhage without free gas. However, as distension of the intestine occurs early in these cases the liver dullness is often absent, and then diagnosis is impossible. Similarly, a differentiation between omenta and spleen cannot be made. It is fortunate that it is of no assistance to the operator to have this differentiation made before making the incision.

Operation.

On arrival the patients were disturbed as little as possible. They were put to bed and their clothes removed. They were not washed. They were given an hour in bed before operation with hot-water bottles and many blankets to rest and get warm. All had an injection of atropine.

A vertical incision 3 in. in length was made about an inch to the left of the middle line through the skin and anterior layer of the rectus abdominis; its lower end was at the level of the umbilicus. The rectus was then freed from its attachments to its sheath and drawn outwards. The posterior layer was divided in the line of the skin incision. Through this incision the abdomen was investigated and when a ruptured spleen was discovered the opening was rapidly enlarged, chiefly by extending it upwards to the costal margin.* If necessary the rectus can be divided transversely either in part or entirely. A considerable amount of room is gained by this manœuvre, but the occasions on which it is required are extremely few and the chances of a bad scar enormously increased. Moreover, if the spleen is "mobilized" in the manner to be described the necessity for the extra amount of room will not be felt.

Standing on the right side of the patient, the right hand is passed below and behind the spleen and the lieno-renal ligament identified and torn through with the fingers. When this has been done, further pressure backwards and upwards directed against the lower pole of the spleen will cause the upper pole to rotate forwards and appear in the wound, when the organ is readily delivered. In this manner control of the entering vessels, and consequently of the haemorrhage, is most rapidly attained. Some cases of rupture can be dealt with by suture, but in the whole of this series the tears were multiple and the spleen tissue too friable for the sutures to hold. Consequently the pedicle was ligatured in two or three sections close to the hilum and the spleen removed. The proximal end of the lieno-renal ligament must be examined for possible bleeding vessels, and these dealt with if found. The advantages of mobilizing the spleen at once may be thus summarized: All bleeding is under control in about a minute from the time the hand is passed down to the organ; neither a transverse division of the rectus, nor, in fact, a very long incision is required; the fate of the spleen can be decided without interference from fresh haemorrhage. The remainder of the operation consists in mopping out the blood from the peritoneal cavity when the patient's condition allows and closing the wound.

After-Treatment.

The after-treatment does not differ from that of any other considerable abdominal operation. Actually the following procedure was carried out: (1) Intravenous injection of two pints of glucose solution, commencing during the closure of the wound; (2) half a pint of saline

* From recollections of a picture of a paracostal incision in a book on operative surgery such an incision was tried on one occasion. Fortunately the case was one of ruptured omentum which could be dealt with by this route, as neither the spleen nor any other organ could be easily approached from this direction. It is unsound anatomically.

solution hourly by the rectum as long as the patient continued to retain it; (3) pituitrin ½ c.cm. every four hours until the pulse settled down. In practice this amounts to three or four injections.

Appearances of the Spleens Removed.

With one exception all the spleens were enlarged. The largest weighed 19 oz., 20 oz., and 28 oz. respectively. The tears were multiple in all, and varied in severity from nearly complete division of the organ to mere rents in the capsule. Extravasations of blood into the spleen pulp were also numerous. The spleen tissue was soft and friable.

Effects of Removal of the Spleen.

(*a*) No ill effect was noticed while any of the patients were in the casualty clearing station, and news of two patients some months after operation was entirely satisfactory. No information about the remaining four has been obtained. (*b*) A very high leucocytosis occurs rapidly after splenectomy, which is not apparently to be accounted for except as a consequence of the loss of the organ. No series of observations was made, but the following figures from four cases are illustrative:

(*a*)	42 days after operation		...	22,300
(*b*)	16	,, ,,	...	20,000
(*c*)	5	,, ,,	...	45,000
(*d*)	2	,, ,,	...	16,000
	12	,, ,,	...	12,000

White counts on two cases of nephrectomy for injury showed no excess. (*c*) Any operation in a malarial subject is likely to determine a relapse. A case of splenectomy is no exception, and the relapse does not differ clinically from those occurring in patients with spleens. (*d*) Late haemorrhage occurs sometimes after splenectomy. This event occurred in one case. About ten days after the operation there was a sudden severe haemorrhage from vessels in the abdominal wound. A considerable amount of blood had managed to find its way into the peritoneal cavity, but its origin was entirely extraperitoneal; it was arrested by ordinary methods and did not recur. There was no history of haemophilia and to a rough test the coagulation time appeared quite short.

I am indebted to Colonel Kelly, A.M.S., for permission to publish this series of cases.

SOME POINTS CONCERNING THE OPERATION FOR VARICOSE VEINS.

BY

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I RECENTLY witnessed an operation for varicose veins performed by another surgeon; it was needlessly tedious and bloody. As the operation is much simplified by the method that I have adopted for some time, I have thought that an account of it might be helpful to others.

I have tried the various new implements that have been devised for the operation, such as strippers and extractors, but they have not given satisfactory results in my hands, so I have returned to the simpler method of excision, which I perform as follows:

The night before operation the limb is dry shaved, rubbed with ether, painted with iodine, the veins marked with an indelible pencil, and then wrapped in a sterile dressing. The patient having been anaesthetized, the limb is held in the vertical position for a couple of minutes and emptied of blood as thoroughly as possible by firm upward kneading, and a tourniquet applied to the thigh as high up as necessary.

Suitable incisions are then made and the veins removed, the cut ends of the main veins and the larger tributaries being ligatured with fine catgut. The incisions are then closed by means of Michel's clips, the limb wrapped in large sterile pads, and a bandage applied evenly and firmly, but not too tightly, from the foot upwards. The tourniquet is then removed.

As the limb is bloodless the operation can be performed very rapidly, for the thickened veins are quite easily recognized and dealt with. Time need not be wasted in tying small tributaries, for the firm bandage effectually prevents subsequent oozing with the formation of those haematomata which so delay healing. The use of Michel's clips has many advantages over ordinary interrupted or continuous sutures—they are far more rapidly applied, the necessary eversion of the skin edges is ensured, and the wounds consequently heal soundly with the formation of firm linear scars. The edges of the wounds are so thin that the use of any other form of suture is almost bound to result in more or less inversion of the skin edges, so that gaping of the incisions takes place after the sutures are removed, and results in slow and tedious healing, leaving thin wide scars that are often tender.

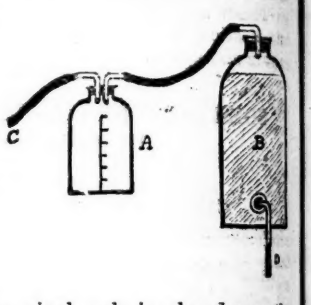
Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

AN ASPIRATOR FOR PARACENTESIS THORACIS.

I HAVE found the apparatus here described and figured very convenient for tapping haemothorax. Others may be using a similar arrangement, but, as I have not seen it described, a short note on it may be useful. It is quite simple and inexpensive, and can be put together from easily obtained materials. In most hospitals there is only one aspirator, but in a ward where chest cases are dealt with a second, not in general use, is a considerable convenience.

The apparatus, as shown in the figure, consists of two bottles connected by pressure tubing. The larger bottle, B, holds anything up to two quarts of water, and has an outlet at the bottom, D, to which is attached about a yard of indiarubber tubing furnished with a pinchcock (not shown in the figure). The bottle A holds fifteen to twenty ounces, and is connected by the tube C to some form of aspirating trocar and cannula. It is convenient to graduate it in ounces. The whole apparatus must be air-tight at all joints. When in use the bottle B is filled with water, and the long tube D is allowed to hang vertically, its lower end dipping below the surface of some water in a large jar. The pinchcock is placed near the lower end of the tube, and a little water run out to remove any air bubbles. The trocar and cannula having been inserted in the pleura the pinchcock is opened, and negative pressure set up in the bottle A by the fall of level in the water in the bottle B.



I have found an aspirating needle known as Hodder's convenient to use, as it provides a good attachment for the indiarubber tube. The side tube of the ordinary Potain's trocar is too short to allow of an airtight joint. When the bottle A is full, the pinchcock is closed, the indiarubber cork removed and the bottle emptied; B can similarly be refilled with water if required. The stream of blood or serous fluid is watched as it runs into A, and its volume regulated by partially opening or closing the pinchcock, and thus altering the rate at which the water escapes from B.

The advantages of the apparatus seem to me to be: (1) It is cheap and easily made; (2) it is easily cleaned; (3) a continuous negative pressure is maintained; (4) there is no arm-aching exercise of pumping necessary; (5) there is no pump to get out of order.

It might be elaborated by introducing a manometer through the cork in the bottle B, or a funnel for filling it, but in practice I do not think these are required.

J. M. FORTESCUE-BRICKDALE, M.D., M.R.C.P.,
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BLOOD PRESSURE IN WAR TRAUMATISMS.

IN the BRITISH MEDICAL JOURNAL of August 10th (p. 132) Dr. E. F. Cyriax states that in certain cases of unilateral traumatisms the blood pressure readings taken with the Riva-Rocci apparatus were different in the two arms, but that this difference tended to disappear as recovery took

place. From the figures he gives it appears that usually, though not invariably, the systolic pressure was higher on the injured side.

These cases are probably special instances of the general law suggested by Leonard Hill and myself in a paper read before the Royal Society in 1913.[1] We suggested that the organism has the power to alter the character of the blood flow to any particular capillary area by altering the resilience or lability of the walls of the arteries supplying that area. Thus, if the walls of the arteries and arterioles contracted and became hard, almost the full percussive systolic pressure obtaining in the great arteries would be brought to bear in order to beat open the capillaries, while with lax arterial walls the capillaries would be exposed to a low systolic pressure. We instanced the conditions obtaining in an inflamed area and in a secreting gland.

It is to be hoped that Dr. Cyriax will continue his observations, as they promise to furnish confirmatory evidence of what is probably a very important though little realized function of the arterial walls.

London, W. S. RUSSELL WELLS, M.D.

LIFE-HISTORY OF ASCARIS LUMBRICOIDES.

MEDICAL practitioners who have worked in tropical and subtropical countries cannot fail to be deeply interested in the recent discussion in the BRITISH MEDICAL JOURNAL on the life-history of *Ascaris lumbricoides*, and in Dr. George C. Low's paper on the same (March 9th, 1918). I have worked for fifteen years in the Fuh Kien Province of China. By systematic examination of the stools of hospital in-patients I established the fact that 100 per cent. of the population of that particular locality harboured *Ascaris lumbricoides*. Long before there arose any discussion concerning a possible pulmonary circuit I had learnt to know the "wormy cough" of the more heavily infected. It had also become a matter of practical experience that bronchitis in children could not infrequently be cured by doses of santonin and aperients alone without the assistance of expectorants. In fact, it almost seems to me now that the scientific results arrived at by the work of Lieut.-Colonel Clayton Lane and Major F. H. Stewart should have come as platitudes to us of the East—they so obviously fit in to our knowledge of signs and symptoms of *Ascaris lumbricoides* infection. On the other hand, the intermediate host theory did not fit in. By experience (often bitter experience) we knew that vegetables fertilized with night-soil were a most sure cause of infection, and that all uncooked and partially cooked vegetables must be rigorously avoided. We also knew, though I cannot give the scientific basis of the knowledge, that for any foreign resident in China a bi-monthly dose of santonin is a wise precaution. This raises the question of the duration of the life-circuit. Other questions of great importance to the practitioner in infected districts concern the length of time that the eggs can retain their vitality (*a*) stored in pits of night-soil, (*b*) in the air or in damp soil. Ankylostome eggs are destroyed by prolonged storage in pure night-soil, but it does not appear that the eggs of *Ascaris* are destroyed by any process to which the Chinese agriculturist submits them.

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Dong Kan Hospital, Fuh Kien, China.

[1] The Influence of Resilience of the Arterial Wall on Blood Pressure and on the Pulse Curve. S. Russell Wells and Leonard Hill. *Proceedings of the Royal Society*, Series B, 1912-1913, p. 180.

H. VINCENT and G. STODEL have described to the Académie des Sciences (July 16th) a serum for gas gangrene prepared from the horse by injecting the chief varieties of anaërobic microbes which cause the disease. They produced gas gangrene in 89 guinea-pigs by inoculation of the *Bacillus perfringens* into the thigh muscles, followed by crushing by pincers these muscles in the anaesthetized animals; after this double action of the bacillus and the trauma gas gangrene usually appeared in about eighteen hours. The mortality of the unprotected animals was 79 per cent., of the protected only 4½ per cent. The serum was used in fifty soldiers with severe badly infected wounds of thighs or buttocks; all remained free from gas gangrene. It was used in thirteen cases of more or less advanced gas gangrene, four of which were regarded by the surgeons as hopeless; twelve recovered. The local and general symptoms usually showed rapid amelioration, sometimes within a few hours of the inoculation of the serum.

Reviews.

ANATOMY APPLIED TO PHYSICAL TRAINING.

IN the welcome book on *Applied Anatomy and Kinesiology*[1] by Professor BOWEN we have further evidence of a discontent with the conventional method of teaching the action of muscles. In noting the appearance of Dr. W. Colin Mackenzie's work, the statement was made that the causes which are revolutionizing our manner of looking at muscles in action were at work in pre-war times. The work now under review is further proof that this surmise is correct. Professor Bowen has approached the subject not from a clinical point of view, as Dr. W. Colin Mackenzie did, but from the standpoint of a man who has to teach teachers the principles of physical education—the principles of orthopaedics, if we use that word in its original sense. He found that even our best textbook in anatomy did not help him to explain how the movements employed in physical training were carried out, nor could the standard textbooks in physiology give him direct help as to how those movements assisted in making the growing body straight and symmetrical. Professor Bowen found, as the clinician had also discovered, that the men who could help him were Duchenne, Beevor, and Sherrington, and we have no doubt, if John Hunter's writings were as well known to our American allies as they deserve to be, Professor Bowen would have also acknowledged his help. What the author of this work has done—and he is the first to have done it so far as we are aware—is to apply to the anatomical facts of our textbooks the observations of men who have studied muscles in living men, under conditions of health as well as under conditions of disease, and has thus produced a much-needed work. Professor Bowen's book is the first volume of "The Physical Education Series," edited by Dr. R. Tait Mackenzie, Professor of Physical Education and Physical Therapy in the University of Pennsylvania. The editor, in a preface, states his belief that "a large audience awaits" Professor Bowen's book. We have no doubt that is true as regards the United States, and we hope it will also prove true of our own country, for the conditions of our industrial life make physical education a matter of real importance to us.

There are many points, had space permitted, which deserve our commendation, and a few, perhaps, which demand our criticism. There is one of these latter points which, because of its practical importance, we cannot afford to let pass by without protest. It is one regarding the improvement of breathing by physical training. In his account of expiration Professor Bowen repeats the erroneous statement, so common in even our best textbooks, that expiration is a purely physical, not a muscular, act. When, however, he comes to interpret the traced records taken of the movements of the living thorax, he realizes that there is the clearest evidence in their expiratory phases that expiration is just as much a controlled and muscular act as inspiration; but evidently the authority of tradition is too great for him, and, instead of trusting his own eyes and judgement, he repeats the ancient and erroneous teaching. The inclination to follow accepted teaching in spite of his better judgement is a weakness shown in many parts of Professor Bowen's otherwise excellent book. He accepts, too, the well-expanded—super-expanded—chest as the ideal for which teachers should work. For instance, he notes that when we attempt to fill our lungs beyond a certain point we expand our thorax at the expense of our abdominal capacity. In the extreme phase of inspiration, as the thorax expands the abdomen diminishes, because the abdominal viscera are drawn within the subdiaphragmatic space. He would aim at obtaining all the expansion that could be obtained by both thorax and abdomen for the direct expansion of the lungs. Now those who are familiar with the training in chest expansion by a certain school of London teachers know that irrevocable harm has been, and is being, done to the lungs of young men. Lungs are really delicate organs, and Nature has taken a great deal of pains to safeguard them

[1] *Applied Anatomy and Kinesiology: The Mechanism of Muscular Movement.* By Wilbur Pardon Bowen, M.S., Professor of Physical Education, Michigan State Normal College, Ypsilanti, Michigan. Philadelphia and New York: Lea and Febiger. 1917. (Med. 8vo. pp. xii + 316; 189 figures.)

against over-expansion. Professors of physical training take endless efforts to break down these safeguards, and in many cases succeed. We hope Professor Bowen will think over this point, and particularly follow out the after-history of the young athletes who trained themselves until they became poulter-chested. Our experience is that they become more liable to lung and heart disturbances than those who have never emerged from a state of physical deterioration.

ANTITYPHOID LIPOVACCINE.

MANY millions of men and women must have received antityphoid inoculations during the last four years to protect them against typhoid, paratyphoid A, and paratyphoid B fevers. The types of T.A.B. vaccines employed are notoriously various, and none has received general recognition as the best. All have the disadvantage of producing local or general reactions in a greater or smaller percentage of the vaccinated; such reactions are attributed to the presence of adventitious matter—culture medium or what not—that accompanies the bacterial antigens forming the active agent of these vaccines, and cannot always be got rid of in the processes of preparation. Drs. LE MOIGNIC and SÉZARY have recently published a book[2] on anti-enteric vaccine made with an oily excipient in place of the watery excipient commonly used, of which we gave a short account on July 13th, p. 41. The dose is 1 c.cm., containing a minimum of 2,600 million of *B. typhosus* and about 2,300 million each of *B. paratyphosus* A and B. Being held in an oily menstruum, the bacterial antigens are but slowly absorbed from the tissues, and so a single large dose of the lipovaccine is said to be enough to immunize an adult. The lipovaccine is made from nineteen-hour cultures of the virulent strains of the bacteria on agar, washed in normal saline and partially dried in the centrifuge, suspended in oil, and killed by heating to 57° C. for an hour; a little eugenol is added as antiseptic in the case of the paratyphoid bacilli, which are more resistant to heat than typhoid bacilli. The oil used is a mixture of lanoline and oil of vaseline; the bacilli are measured out by weight (5.50 mg. in all to 1 c.cm. of oil). The injection of this T.A.B. lipovaccine is to be made in the subcutaneous tissue of the left deltoid region with the most scrupulous antiseptic precautions. Anything like a severe reaction is said to be quite rare with this new vaccine. It has been administered to over fifty thousand men in France, and is said to give a good degree of immunity for a year, when reinoculation with the same dose is advised.

A STUDY OF HINTON'S PHILOSOPHY.

JAMES HINTON, the aural surgeon as well as writer of many philosophical works, the least forgotten of which is *The Mystery of Pain*, not to be confused with his senior colleague at Guy's—John Hilton, the author of the *Lectures on Rest and Pain*, so well known to a former generation of students—died at the Azores of cerebral tumour in 1875. For many years a presentation of his moral speculations has been in preparation, first by Mr. Havelock Ellis, who, however, handed it over some twelve years ago to his wife, by whom the completed manuscript was delivered to the publishers shortly before her death in 1916. The volume, *James Hinton: A Sketch*,[3] is not a biography, as the title might suggest, and indeed this need was met in 1878 by Miss Ellice Hopkins's biography, but an analysis of Hinton's peculiar views and aims and of the new civilization he foreshadowed. He was a remarkable man and came of an ancestry with unusual characteristics, and it is of him as seer and semi-mystic, and not as an aural surgeon, that this detailed psychological study is presented to the reader. Sir Samuel Wilks, a truly realistic biographer, wrote, "When I say that Hinton was one of the most remarkable men in our profession, I feel astonished that he was in it, but being in it he was not of it. I believe that accident alone made him a medical student, just as a kind of chance gave him his specialty."

Hinton's revolutionary suggestions on sexual relations and his drastic conclusions for the reformation of prigs and hypocrites were so often lacking in humour that it is no wonder his hearers went away open-mouthed saying, "This man hath a devil." It is a pity that he advocated polygamy in place of monogamy without attempting to define exactly what he contemplated in these sexual relationships. He was rent by the apparent contradictions of his theories, which, when attempted in practice, often led to disaster, and he was probably within the mark in his statement that it would take two hundred years for his ideas to work out, and yet he put them forward to his followers as if ripe for immediate adoption. This well-written volume is an interesting study of his mental outlook, but, like *The Mystery of Pain*, though at first attracting, will subsequently rather puzzle the ordinary reader.

ANATOMY OF THE NOSE AND EAR.

DR. ADAM E. SMITH'S *Studies in the Anatomy and Surgery of the Nose and Ear*[4] will be welcomed by many readers on account of the attractive collection of plates quite as much as for the letterpress. The latter is somewhat diffuse, and wanders rather vaguely from the anatomy and surgery of the nose and ear into the discussion of such questions as the importance of nasal breathing and the treatment of intranasal conditions, which is, of course, very instructive but a little out of the picture. The anatomy is very well displayed in several series of frozen sections with clear descriptions; no one can carefully study them without obtaining additional grounding in his knowledge of his way about the intricacies of the nose and its annexes. The approach to the pituitary body is made very clear, and operations on it seem to come within the scope of rhinology; at the same time it is certainly at the furthest limits of the field, and it is to be hoped that rhinologists will not be too greatly daring unless their experience in intranasal technique has been considerable, however simple the operation appears to be made by the atlas before us.

In regard to the ear the author begins with a disquisition on the postural treatment of otitis media or mastoiditis. This is combined with active treatment, which includes a prompt and extensive paracentesis, to which we should attach more value in preventing mastoid involvement than the influence of posture in regard to such small cavities as the inflamed antrum and aditus in which there is little scope for gravitation. The antero-posterior sections illustrating the anatomy of the ear and temporal bone, if studied from without inwards, will be found to afford good guidance in operating on those parts. They should, however, be compared with an actual temporal bone, so that the perspective of the parts may not be lost. The ingenious partition of the surface of the mastoid region is easy to remember, and with some allowance for variations will be most helpful to the young operator, as long as he is prepared to go slowly and layer by layer. There is a little obscurity as to the depth of the facial nerve, which in one place (p. 130) is described as 2 cm., and in another (p. 136) $1\frac{1}{2}$ cm. from the surface of the mastoid. The process of exposing and everting the facial nerve is well described.

Altogether this is a good practical work which, measured by its information, can be most strongly recommended.

NOTES ON BOOKS.

A PAMPHLET by Dr. TRUBY KING, C.M.G., entitled *The Natural Feeding of Infants*,[5] has been issued, with an introduction by Dr. J. S. Fairbairn, by the Babies of the Empire Society, under the auspices of the Overseas Club and Patriotic League. It is a comprehensive essay, written in a popular style and well adapted to attract and retain the attention of the mothers to whom it is addressed. The same society has issued another pamphlet by Dr. Truby King on *The Story of the Teeth*.[5]

The war has given us many poets, and among them must be reckoned Mr. DONALD H. LEA of the New Zealand Expeditionary Force. His volume of poems entitled *Stand Down!*[6] shows no little power to feel and ability to express the major and minor tragedies of war. Many of the poems are written in dialect; they are full of promise and often reach the level of true poetry.

[2] *Nouvelle méthode de vaccination antityphique: le lipo-vaccin T.A.B.* By E. le Moignic and A. Sézary. Paris: J. B. Baillière et Fils. 1918. (Cr. 8vo, pp. 78. Fr. 2.)

[3] *James Hinton: A Sketch.* By Mrs. Havelock Ellis, with a preface by Havelock Ellis. London: Stanley Paul and Co. 1918. (Eight illustrations, pp. xxviii + 283. 10s. 6d.)

[4] *Studies in the Anatomy and Surgery of the Nose and Ear.* By Adam E. Smith, M.D. New York: Paul B. Hoeber. 1918. (157 pp.; 45 illustrations. 4.00 dols.)

[5] London: Whitcombe and Tombs, Ltd. 1s. net each.

[6] *Stand Down!* By Donald H. Lea. With a foreword by Sir Thomas Mackenzie, K.C.M.G. London: Elkin Matthews. 1917. (Roy. 16mo, pp. 77. 2s. 6d. net.)

DRIED MILK AND THE LOCAL GOVERNMENT BOARD.

THE Cheshire Local Medical and Panel Committee has addressed a letter to the President of the Local Government Board, directing attention to the dangers of misdirection of effort apparent in some developments of the maternity and child welfare and other "health campaigns" fostered by the Local Government Board. The letter continues:

"1. My committee apprehends that the authority of medical practitioners in the guidance of their patients may be undermined by the teachings of partially trained or untrained persons working in connexion with approved child welfare centres. The tendency shown by those in authority to entrust the direction of the campaign to partially trained persons may be illustrated by your own remark in your address on August 2nd to the conference at the Central Hall, Westminster, to the effect that the health visitor was the axis round which the whole centre revolved. I am to point out that this pronouncement is exactly contrary to the principles which my committee understood were authoritatively laid down by Sir Arthur Newsholme in his covering letter to the order on which the scheme is based. In that letter the medical officer of the centre, not the health visitor, is emphatically stated to be the directing and originating factor of all its activities.

"2. A second danger is that of extending the sphere of work of the centre to embrace treatment. In the opinion of my committee the need should be met thus: The medical officer to a centre should prepare and send a weekly return to each doctor whose patients attend, stating the names of those patients, the nature of the hygienic and dietetic advice given, and any abnormality, illness, or tendency to disease requiring his attention. That would be a true step in preventive medicine. Even when something more than *general practitioner treatment* is necessary, it should be the patient's own doctor who initiates it.

"It may be remarked, parenthetically, that there are few general practitioners who are not capable of carrying out treatment in one or more of the special departments of practice. There are few who cannot transcend, in one direction or another, the dead level of purveying 'such treatment as is of a kind which can consistently with the best interests of the patient be properly undertaken by a general practitioner of ordinary professional competence and skill.'[1]

"It is *facilities* that are lacking, such facilities as are provided by the local voluntary hospitals, but which are inadequate both in amount and distribution for the needs of present-day practice. As Sir Bertrand Dawson says: 'Though it is quite right that consultants and specialists should be available to help the general practitioner, these are not nearly so important as providing the means for the general practitioner to help himself.'[2]

"3. The third danger which I am to mention is the advocacy of mistaken measures.

"The responsibility assumed by the Government in advocating methods of dealing with conditions of health and disease based on recent departures from established medical practice has not always been justified by results. Three recent illustrations may be given:

"(*a*) The launching, on the model of 'tuberculin' dispensaries, of the present scheme of tuberculosis dispensaries."

The letter points out that tuberculin as a remedy for pulmonary tuberculosis, the only defensible *raison d'être* for the dispensaries, has fallen into discredit. "The argument that the dispensaries could examine *contacts* was an afterthought, a bolster to a failing cause. *Contacts* can be far better examined by the family doctor, who could provide the chief tuberculosis officer with more useful information than would be otherwise obtainable. In our judgement the *chief* should be the *only* tuberculosis officer in a county. He should be a physician of established reputation, not necessarily a whole-time officer. Such an one, with the assistance of a county profession enjoying the clinical facilities alluded to, would organize a far more effectual campaign than would any dispensary system. The whole scheme was built on the shifting sands of immature knowledge.

"(*b*) The second illustration my committee desires to adduce of action taken by the executive authority on immature knowledge was the setting up of unnecessarily large and costly venereal disease treatment centres by the public authority on the special ground that general practitioners could not be trusted to administer salvarsan. As Lieut.-Colonel Harrison (of the Rochester Row Hospital) has shown in his recent book, salvarsan administered by intramuscular injection—a proceeding precisely similar to other injections which form part of every practitioner's routine work—is of superior efficacy to the same drug when administered by the more delicate intravenous method which was supposed to be beyond the competence of an ordinary doctor. In this county, happily, the true facts, after vigorous representations by this committee, have been wisely recognized by the county council and the Local Government Board, and salvarsan is now gratuitously obtainable by any practitioner from the public authority for administration to such of his patients as may need it.

"(*c*) A third departure from established medical practice is the prominence given in child welfare clinics held under the auspices of the Local Government Board to the use of dried milk in infant feeding.

"The Local Government Board leaflet, *Dried Milk for Infants*, dated March this year, states: 'Experience during the last twelve or fourteen years shows that dried milk is one of the most satisfactory forms of cow's milk for use in the feeding of infants.' That is a most misleading statement. The very large and carefully recorded experience of the Manchester Children's Hospital on the relative sickness incidence in breast-fed babies, babies fed on cow's milk, and babies fed on dried milk, shows that whilst breast-fed babies suffer least, babies fed on dried milk have a far higher sickness-rate than those fed on fresh milk. Dr. Ashby, Physician to the Manchester Children's Hospital, writes on June 11th, 1918: 'I have no hesitation in saying that I have found cow's milk superior to any dried milk or artificial food in my work with infants and young children at Manchester and Salford.'"

Dr. Truby King, C.M.G., and Dr. Chapin are quoted in support of the contention that "A food that causes a gain in weight may not be a good food for an infant. The scales alone are not a safe guide." The letter continues:

"My committee do not pose as experts on infant feeding; but the matter is one with which, as general practitioners, they are much concerned; and they recognize that the very convenience of dried milk may be its passport to a dangerous popularity, and that the governing authorities would be on safer if more difficult ground in pursuing the campaign for clean milk than in popularizing what after all is admittedly a damaged article. Want of cleanliness in the source, handling, and transport of milk cannot usefully be remedied by subsequent methods of treating the fluid which impair, if not its food value, at any rate its stamina-producing value. Tuberculous infection from some source is inevitable sooner or later. You may boil a child's milk; but, as Mr. Robert Mond says, you do not boil his butter. His stamina is his best protection. Much, however, in the opinion of some of my committee, could be done to reduce milk-borne tuberculosis if the authorities were to encourage the policy advocated by Professor Delépine, at the Mid-Cheshire Farmers' Club and elsewhere, of feeding all cows, in herds in which instances of tuberculosis have occurred, for the butcher, at the end of the fourth lactation, when latent tuberculosis will seldom have become manifest, or communicable, either through milk to the human consumers or through the nasal and alvine discharges to other animals."

The committee, in submitting these instances of the increasing degree in which the Local Government Board is entering the province of the medical practitioner, remarks:

"You cannot diminish the responsibility of the practitioner for his patient. It is therefore impolitic as well as unfair to limit or hamper him in the execution of his duty. Either he is competent, or he should not be on the *Register*. If competent, he is conscientious. He will know what form of treatment he can himself undertake, and for what he must refer his patient to a consultant. His position

[1] Insurance Act, Med. Ben. Reg., 1st Sched., § 2 (i).
[2] BRITISH MEDICAL JOURNAL, July 13th, 1918.

and authority are only weakened if a third party with an official status, and on official instructions, offers advice to his patient. The practitioner needs help and facilities which it is in the power of the Government to supply, especially those facilities provided in some districts, and in some degree already, by the smaller voluntary hospitals in which general practitioners can treat their own patients; and it is hoped that to fostering developments with that object the activities of the department of Government concerned may be directed."

THE AUSTRIAN MINISTRY OF HEALTH.

THE Ministry of Health which has recently been established in Austria with the object of centralizing the work of many Government departments has a most ambitious programme. Not only is the work of existing departments to be taken over, but new departments and services are to be instituted and radical reforms of medical education and the conditions under which medical work is done are to be effected. Though little has been heard in this country of the origin of this Ministry, its birth, to judge by stray references, has not been easy. The agitation for it has lasted several years, and it does not appear to have escaped bitter obstruction. Now it is pointed to enviously by writers in the German medical press as an institution which ought to be speedily copied in Germany. The following outline of the Ministry's functions is given by Professor Schwalbe:[1]

Professor Horbaczewski, formerly a Minister without portfolio, is the new Minister. Sixteen different spheres of activity are created:

1. Infectious diseases (including tuberculosis and venereal disease) and drunkenness.
2. Veterinary matters and the laws and regulations affecting the health of man.
3. Municipal sanitation (without prejudice to the powers of the Ministry of Public Works with respect to building and water), housing and town planning, and regulations affecting health resorts and precautionary measures in mining industries.
4. Commercial hygiene, including hygiene at sea and in connexion with emigration.
5. Food hygiene. Supervision of food supplies without prejudice to the Ministry for Food. Examination of foods.
6. Mother and infant welfare. Care of the young in crèches and other establishments, and of orphans. Co-operation with the Ministry for Education in matters affecting the health of the school child, and with the Ministry for Public Works in hygienic matters connected with industry and courses of instruction. Medical supervision of the young above school age and of the physically and mentally deficient.
7. Professional and industrial hygiene, with special reference to the prevention of industrial diseases and accidents. Control over work at home and the work of women and children. Hygiene of mining industries. Participation in the medical aspects of public and private insurance.
8. Supervision of general, maternity, foundling, and mental hospitals. Care of the incurable. First aid and ambulance work.
9. Prison hygiene.
10. Supervision of the trade in drugs, including dietetic and cosmetic preparations. Control of poisons and substances injurious to health without prejudice to the Ministry for Commerce.
11. Supervision of affairs relating to the disposal of the dead.
12. Health matters affecting war sufferers. After-care of the sick and wounded, with participation in their re-education, in providing homes for soldiers, and in the care of war refugees, including rebuilding in areas devastated by the war.
13. Supervision of doctors, chemists, midwives, and nurses. Participation in the management of medical and pharmaceutical education, and in dentistry.
14. Penal matters affecting national health.
15. National health statistics.
16. Support of all voluntary efforts to promote national health, with special reference to various societies and funds.

The Ministry is also given certain powers in connexion with the railway services.

By the inclusion of all these departments under one Ministry it is anticipated that a many-sided problem as that of tuberculosis, involving such widely different matters as housing, food, etc., will be grappled with more successfully than heretofore. The campaign against venereal disease is to include a limited scheme of compulsory notification and, under certain conditions, compulsory examination and treatment of persons particularly exposed to, or likely to convey, the disease to others. The new regulations will apply chiefly to prostitutes, wet nurses, domestic servants, and to foundling homes, asylums, and other public institutions. Penalties for propagating venereal disease knowingly are included in the Ministry of Health's programme. The campaign against drunkenness is to take the form of legislative measures affecting children and adolescents, as well as special services (railway, medical, teaching and others). The war having revealed the evil of an unregulated food supply, the Ministry will undertake to protect the consumer, particularly the poor and the young, from exploitation, and to provide an adequate supply of nutritious food.

Medical supervision is to be extended to adolescents above school age, and under the department for industrial hygiene a special medical service is to be established, admission to which will require special graduate as well as post-graduate training; it is not clear whether, in the graduate teaching for this work, subjects are to be eliminated from, as well as added to, the standard curriculum of medical education. If, as seems possible, the Ministry intends to create a medical service staffed by men who have specialized in a particular branch from the commencement of their studies, a principle has been adopted which will probably have far-reaching effects on the status of the medical profession. Other prospective changes in the medical curriculum include the institution of the "practical year," for securing clinical experience. Special training is also to be provided in such subjects as tuberculosis, and maternity welfare, and post-graduate study is to be systematically encouraged. It is further intended that by providing medical officers of health with greater powers, as well as a more specialized education, they shall hold more independent positions than heretofore. Hitherto they would appear to have been hampered by routine office work and by the fact that their duties were advisory and consultative rather than responsible and executive.

[1] *Deut. med. Woch.*, January 10th and 17th, 1918.

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the Committee held on August 13th twenty-four cases were considered, and £212 6s. 8d. voted to twenty-two of the cases. The following is a summary of some of the cases relieved:

Widow, aged 51, of M.B.Glasg. who died in April, 1918. Left entirely without means, and suffering from chronic rheumatism. Daughter, aged 25, at home to look after mother; son, 22, second lieutenant, prisoner of war; son, 19, in the army, and allows his mother 3s. 6d. a week. Voted £4, with leave to apply again in October.

Daughter, aged 60, of M.R.C.S.Eng. who died in 1904. Applicant's only income £30 from investments; in the winter suffers severely from bronchitis, so only able to earn a little in the summer. Voted £12 in twelve instalments.

Widow, aged 39, of L.R.C.P.Edin. who died in March, 1917. Applicant was left with two children, now aged 5½ and 3½ years. She earns £115 in a temporary post, and her father, who lives with her, pays the rent of the house. Asks for help towards education of children. Voted £4; the Guild will help.

Daughters, aged 56 and 53, of M.R.C.S.Eng. who died in 1890. Each has an income of £11 6s. from dividends. They obtain occasional work as governesses. Each relieved three times. Voted £9 in twelve instalments.

Widow, aged 51, of M.R.C.S.Eng. who died in 1906. Was left with limited means and one daughter, now aged 19, who is training for a teacher. Income from dividends, £10. Voted £10 in two instalments.

Daughter, aged 68, of M.R.C.S.Eng. who died in 1881. Applicant lost her income by the failure of an Australian bank and is a permanent invalid dependent on friends and help from the Fund. Relieved five times, £60. Voted £12 in twelve instalments.

Widow, aged 76, of M.B.Edin. who died in 1913 after a very long illness which exhausted all their savings. Voted £12 in twelve instalments.

Subscriptions may be sent to the Acting Honorary Treasurer, Dr. Samuel West, at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild is now called upon, as a result of the war, to deal with many widows and children who, in happier times, would not have thought of asking for assistance. It is glad to receive secondhand clothing and household linen. The class of clothes most wanted is that suitable for boys and girls working in offices, for women, and for old men. The gifts should be sent to the secretary of the Guild, 43, Bolsover Street, W.1.

British Medical Journal.

SATURDAY, SEPTEMBER 14TH, 1918.

THE ORGANIZATION OF RESEARCH.

THE Committee of the Privy Council for Scientific and Industrial Research has published its third annual report (for the year August 1st, 1917, to July 31st, 1918).[1] Practically it is a new Government department which administers the Imperial Trust for the Encouragement of Scientific and Industrial Research. During the last financial year the Committee expended £30,825, and it is convinced that the value to the nation of the work done is beyond all comparison greater than the cost, and will, as time goes on, bring continually augmented returns, for the garnering of the harvest of research is sure though slow. The estimated expenditure for the current financial year is £163,350, which includes a sum of £89,750 for the National Physical Laboratory. In addition, the laboratory is rendering services to the several war departments, which will be met out of the vote of credit, at an estimated cost of £74,100. The grants in aid of industrial research associations will be met out of the fund of one million held by the Imperial Trust.

The report by the Advisory Council, of which Sir William McCormick is chairman, and Sir Frank Heath, K.C.B., secretary, gives an account of the progress made in the establishment of these associations and the steps that have been taken in the organization of national research. Some thirty industries are actively engaged in establishing such associations, and licences have already been issued by the Board of Trade to three. Among them is the British Scientific Instrument Research Association, founded through the efforts of the optical industry; the Department has guaranteed a total expenditure by this association, in accordance with an approved scheme, of not more than £40,000 during the first five years. In accordance with the terms of the agreement with the Royal Society, the Department became responsible for the maintenance of the National Physical Laboratory on April 1st, and has given special attention to the salaries of the scientific and technical staff. Hitherto the laboratory, to balance its expenses, has been obliged to rely in the main upon fees paid to it for testing; as a result its officers have been seriously underpaid, and the best of its senior men are continuously being attracted away from it. It is now recommended that the scales of salaries should be completely overhauled, and that adequate provision should be made for superannuation.

One of the subdepartments through which the Department of Industrial and Scientific Research works is the Food Investigation Board, of which Mr. W. B. Hardy, secretary of the Royal Society, is director. This board has several subcommittees—on fish, on meat, on fruit and vegetables, on oils and fats, and on engineering. It has been giving particular attention to the preservation of food, especially by cold storage. It is acting in close consultation with the Food (War) Committee of the Royal Society, and the work has grown rapidly. On this head the report contains the following significant observation: "Events have justified the rapid decisions which we took in the summer of last year, while experience has shown that the appointment of a responsible director to organize a group of researches of national importance assisted by an advisory board of distinguished men of science and affairs greatly facilitates prompt action and the proper co-ordination of all the work in accordance with a definite scheme. Research work, like other forms of creative activity, will not flourish under committee rule."

Last year, at the invitation of the Home Office, the Department appointed a committee, of which Dr. J. S. Haldane is a member, to inquire into the types of breathing apparatus used in coal mines. This committee has just presented its first annual report,[2] in which it draws attention to certain serious defects in existing mine rescue apparatus, and in the training of men to use them. The defects, it is stated, are mainly matters of detail, and suggestions are made for their improvement, for the fixing of standards of achievement, and for preparing the ground for further progress in experimental investigations. Experimental work is being carried on for the committee at the Heriot Watt College, Edinburgh, under the direction of one of its members, Dr. Henry Briggs, who has established a physical testing station which will be run by a military staff attached to the Scottish command. For the War Office the committee has examined and reported on several sets of captured enemy breathing apparatus, and has advised that special inquiries should be made into the storage and supply of liquid and compressed oxygen, and other gases. In conjunction with the Admiralty and the War Office a research clearing house committee has been appointed to co-ordinate the investigations into gas problems conducted by the different departments, and to ensure rapid interchange of knowledge and experience, questions of particular difficulty being referred to the science department.

The Department has also established, jointly with the Medical Research Committee, an industrial fatigue research board with Professor Sherrington as chairman. With the board is associated a panel of representative men and women from each of the industries being studied, who will join the board as each trade in turn comes under review. It will investigate "the relations of the hours of labour and of other conditions of employment, including methods of work, to the production of industrial fatigue, having regard both to industrial efficiency and to the preservation of health among the workers." Grants are made to aid researches undertaken by independent bodies and also to individual students in research work; in making them the Council has been guided by its knowledge of the quality of the research work undertaken by the professor or head of the department who recommends the student.

In referring on a previous occasion to the work of this new department we expressed the hope that though it was primarily established to encourage the application of scientific research to industrial methods, it might become the rallying point of other scientific branches subsidized by the Government, eventually developing into an independent Ministry of Science. These hopes have been realized to a considerable extent, and we find no evidence that the department is regarded as a temporary expedient. Indeed, another step forward has been taken which we hardly dared

[1] Report of the Committee of the Privy Council for Scientific and Industrial Research for the Year 1917-18. H.M. Stationery Office. Price 4d. net. (Cd. 9144.)

[2] Department of Scientific Industrial Research. First Report of the Mine Rescue Apparatus Research Committee. H.M. Stationery Office. Price 1s. 9d. net.

to anticipate. The annual report of the Department contains a series of paragraphs relating to the development of the organization of research in the Overseas Dominions. The home Department has been in close touch with the Canadian Honorary Advisory Council for Scientific and Industrial Research, which was incorporated by a Canadian Act of Parliament a year ago. This Canadian council has promoted many valuable researches and inquiries, some of which have already produced important results. Again, in Australia, an Advisory Council of Science and Industry has been established, and has started a number of investigations which have aroused the active interest of manufacturers and others likely to benefit by the systematic application of science to industry. The New Zealand Government took initial steps to organize scientific and industrial research as long ago as 1916, but the matter does not there seem to have passed beyond the stage of discussion. In South Africa there is an Industries Advisory Board, which deals not only with scientific and industrial research, but also with statistics of production, factory legislation, the encouragement of industries, and the development of natural resources. Finally, it is the intention of the Government of India to establish after the war an Industrial Board and Department, which will succeed the Indian Munitions Board and extend its sphere of operations. As the chairman of that board has pointed out, munitions for a modern army cover practically all the wants of the civil community. It is also to be noted that a National Research Council was established in the United States of America in 1916, under the auspices of the National Academy of Sciences, and largely through the initiative of its president, Dr. Welch, and of Professor Hale. This council, as we have shown on previous occasions, did much valuable preparatory work before America entered the war, and since then it has so grown in usefulness and power that President Wilson has issued an executive order putting it upon a permanent basis.

The letter in which the Lord President, Lord Curzon of Kedleston, presents the report of the British Advisory Council to the King in Council, concludes as follows: "The foundations of a national system of scientific research are being truly laid. In the final structure as they (the Advisory Council) are planning it, the universities and technical colleges, the learned societies and the industries will be found taking their due place; not in subordination to the State, as our enemies like to see them, but working together for the common good in helpful co-operation."

THE REVISED "NOMENCLATURE OF DISEASES."

THE *Nomenclature of Diseases*,[1] the fifth edition of which has recently been published, is an official register of the names which at the time of its appearance are applied to diseases and morbid conditions in general. It has been drawn up by a joint committee appointed by the Royal College of Physicians of London, and the work may be regarded as a decennial stock-taking of medical terminology. The object of a national nomenclature is to secure uniformity and consistency in the terms used in making returns for statistical purposes wherever the English language is spoken. Since the least vagueness or contradiction in the use of terms is fatal to the compiling of accurate statistics, and seriously hampers the progress of science, the aim of the *Nomenclature* is to ensure that only such names as are generally recognized and in common use are included in its lists, and that the same names convey the same meaning to all who use them. It does not assume responsibility for the appropriateness of names which it registers, nor attempt to replace them by others which might seem more suitable or less barbaric to the compilers. As far as possible the work is up to date, but it does not profess to include the name of every rare and recently described morbid condition, and the entry of some names of obscure disorders must be regarded as provisional.

With regard to the principles upon which a nomenclature of diseases is based it must be admitted that there is no such thing as uniformity in methods of naming them. The conception of a disease includes its etiology, localization, symptoms, physical signs, course, and pathological consequences upon the organs and tissues which it affects. But a disease in this sense is merely a mental abstraction—it does not exist in its entirety. Our knowledge concerning it is often deficient in one or other particular, and for this reason inconsistency in naming diseases is unavoidable. Thus some diseases are named in accordance with their etiology, and this applies in the main to the large group of "diseases due to infection"; yet some of these, such as syphilis and malaria, although the infective cause is known, still retain the names which they held before their origin was traced. Others, whose causation and pathology are unknown, are called after the symptoms or groups of symptoms to which they give rise; examples of these are "periodic paralysis" and myasthenia gravis. Some names are topographical and descriptive, such as "glosso-labio-laryngeal paralysis," "pulmonary osteo-arthropathy." Other disorders are known by the pathological conditions which they produce—for instance, "arteriosclerosis," "amyotrophic lateral sclerosis," "progressive lenticular degeneration with hepatic cirrhosis." The names of some are purely arbitrary, popular, or colloquial, such as mumps, measles, leprosy. Many such designations are of remote antiquity, and except to avoid inconsistency, no special object is gained by rejecting them. Some diseases have Latin and some Greek names, and some have hybrid combinations of the two; some again are English, and some are named in the language of the country of their origin. The practice of naming diseases after those who first described them is open to objection; yet the desire to perpetuate the fame of distinguished individuals is natural and excusable, and few would wish the names of Bright, Addison, and Hughlings-Jackson to be forgotten in this connexion. Proper names, however, should not be used as main headings but only as synonyms. In regard to the use of synonyms in general, the name of the disease which appears first in the *Nomenclature* is that by which it is usually known; the synonym is the Greek or Latin or English equivalent. The compilers state that in making a return it is optional to employ the name of the disease which appears first, or its synonym.

To meet complaints that the *Nomenclature* does not distinguish between diseases and symptoms an asterisk is affixed to the names of all symptoms, and refers to the footnote printed on every page: "When the cause is known, return should be made under the head of such cause, the local condition being also specified." It has also been contended that a nomenclature of diseases should not contain the names of symptoms at all, yet symptoms and physical signs are an integral

[1] To be purchased through any bookseller, or directly from H.M. Stationery Office. Price 2s. net.

part of disease—the outward and visible, or inward revelation of its presence—and there is force in the plea that, if only for the promotion of verbal economy, recognized names of symptoms should be registered as well as those of diseases.

Nomenclature and classification are intimately connected, and in the progress of science classification is the more important. Names do not matter much so long as all are agreed as to their meaning, but it is essential that things named should be classified so as to show their resemblance and relationship to, and their distinction from, one another. Diseases cannot at present be classified into orders, genera, and species. Their classification must be artificial rather than natural, and it is necessarily tentative and provisional, as each succeeding edition of the *Nomenclature* shows. As stated in the preface to the first edition (1869), "diseases might be classified according to their symptoms, their causes, their intimate nature; according to the tissues or the systems of the body affected; or according to the parts of the body as they lie anatomically." The method of classification which the compilers of the first edition adopted was topographical, diseases being divided into those which affect the body as a whole and those which affect locally different systems and the organs and tissues of which they are composed. The compilers of the fifth edition have adhered to this principle. They have, however, introduced some changes of importance. A large and heterogeneous collection of diseases called "general" in former issues has now been split into three new groups—Diseases of the blood, Diseases of the ductless or endocrine glands, and Diseases due to disorders of nutrition or of metabolism. We note, too, the removal of the whole group of myopathies from the section on diseases of the nervous system to that on diseases of the organs of locomotion. Amongst diseases of the nervous system, and also in other sections, there yet remains a large group which can only be classified at present into "Names of symptoms, groups of symptoms, diseases named with reference to their symptoms, and diseases of which the pathogenesis is not accurately known." A more scientific classification of these disorders has yet to be devised. Overlapping is unavoidable in a topographical division of diseases; thus, for instance, purpura appears amongst diseases of the blood and diseases of the skin. Intoxications, which formerly occupied a column by themselves, are now very properly relegated to the list of poisons in the appendix, and infective diseases are more appropriately termed "Diseases due to infection."

In so far as individual organs and structures admit such classification, the order is as follows: (1) Inflammation and its varieties; (2) vascular conditions—hyperaemia, haemorrhage, anaemia, oedema, thrombosis, embolism, necrosis, gangrene; (3) hypertrophy and atrophy; (4) local manifestations of general diseases, such as syphilis, tuberculosis; (5) diseases and disorders of function special to the organ under consideration; (6) local nervous affections, such as atony, spasm, paralysis; (7) degenerations; (8) mechanical results of disease; (9) cysts and new growths, non-malignant and malignant; (10) effects of parasites; (11) effects of poisons; (12) malformations; (13) injuries; (14) foreign bodies. Varieties or special forms of diseases are usually indicated by being "indented"—that is, printed below and somewhat to the right of the main heading.

The change in the new edition which will perhaps excite most comment is the omission of the triple column of Latin, French, and German equivalents or translations which formed a prominent feature in former issues. The preface states the grounds on which the Subcommittee on Classification decided upon this omission as follows: (1) The ambition of the compilers of the first edition to be the founders of an international nomenclature has not been realized. (2) It is impossible to guarantee the correctness of the French and German equivalents except by international agreement. (3) The insertion of the French and German names of every disease is beyond the scope of a British nomenclature of diseases. As for the omission of Latin and Greek equivalents, it is pointed out that the Latin equivalents are very often translations of English phrases, and that many of the names of diseases in common use are framed upon a Latin or Greek basis, or are hybrid combinations sanctioned by time. Such names, therefore, need not be expressed in separate Latin columns. Moreover, "Latin and Greek names have been incorporated in the text either as synonyms of English names, or as main headings in any case in which the Latin or Greek name is more frequently used than the English equivalent."

In conclusion it may be noted that the *Nomenclature* is not in any sense a textbook of diseases. It is neither didactic nor educational. Its sole aim is to record the names of diseases which are recognized and in common use at the time of its publication, in order that statistics may be rendered both uniform and accurate, and so facilitate control of public health. It will hardly be used except as a work of reference, yet careful comparison between the present and former editions affords valuable indications of the progress of medicine during the fifty years which have elapsed since the Royal College of Physicians first undertook the compilation of the *Nomenclature of Diseases*.

VOLUNTEER FORCE MEDICAL OFFICERS.

DURING the last year our pages have contained records, taken from the *London Gazette*, of the appointment of a large number of medical officers to the Volunteer Force usually with the rank of temporary lieutenant or captain. Owing to the insistent need for the adjustment of medical man-power it is of some importance to consider the circumstances in which these appointments are made. Under Army Council Instruction 18 of 1917 registered medical practitioners are eligible for appointment to the Volunteer Force. Paragraph 2 of the regulations of this force states that: "Liability for service in the Regular or Territorial Forces is in no way affected by enrolment in the Volunteer Force." A.C.I. 18 of 1917 further stated that "membership of the Volunteer Force in no way excuses a medical man from liability to be called up for service by the Central Medical War Committee." The National Service Ministry and the Central Medical War Committee are, we understand, aware of these conditions. But when we come to the liabilities which are incurred by medical men who join the Volunteer Force the position is much more doubtful. The ordinary citizen who now joins the Volunteer Force has ceased in most cases to be a volunteer. In a memorandum dated August 20th, 1918, and issued to the tribunals by the Local Government Board and the Scottish Office, it is pointed out that under Section 4 (6) of the Military Service (No. 2) Act, 1918, "every person to whom a certificate of exemption shall be granted by a tribunal after the 30th April, 1918, shall, unless the tribunal by which the certificate is granted otherwise direct, be liable on being so required in such manner as may be prescribed by Order in Council to join the Volunteer Force and remain a member of that force for the period during which the certificate remains in force, and shall, during that period,

attend such drills, undergo such training and undertake such military duties as may be so prescribed." In paragraph 3 of the memorandum the Local Government Board indicates that where no entry relating to service in the Volunteer Force is made on the certificate of exemption, an ordinary citizen up to 50 and a doctor up to 55 automatically becomes liable to volunteer service if and when required unless he is a Grade 3 man noted as fit only for sedentary work; though even in this case, when granting exemption, tribunals should "consider whether some form of alternative part-time service should not be imposed." Where a tribunal "considers that it would not be reasonable to require the man to perform volunteer service, they *must be careful always to enter* in his exemption certificate that he is relieved of the volunteer liability." We gather that it is the practice of the Central Medical War Committee, when sitting as a medical tribunal, to relieve of the Volunteer Force liability medical men whose application for exemption from military service is granted. Consequently, for most of the medical men who join, service in the Volunteer Force remains a voluntary service. Nevertheless, the Volunteer Force being now what it has paradoxically become—namely, a compulsory service for certain classes of men—it is clear that the duties of the members of the force will, in the future, be much more definite and exacting. The Local Government Board memorandum describes the duties required from members of Section B of the various arms of the service to which the Volunteer unit which a man is required to join belongs, under two headings: those required of men placed in Division (T) of Section B, and those placed in Division (S). While the duties of men placed in these two divisions of Section B do not appear to involve extensive or continuous training, still the medical officers of the force, even though they are not serving in Section B, must of necessity undergo some commensurate form of training, the more so if they happen to be called on to assist these units in relieving other troops in home defence. So far we have not discovered any clear definition of the liability, either with regard to training, or in connexion with service in an emergency, of medical men who join the Volunteer Force. But there would seem to be indications that the duties of Volunteer medical officers are likely to become more onerous than may have been anticipated by the medical men who join. If this surmise should prove correct, the Professional Committees would do well to urge the military authorities to define at the earliest possible date the duties they expect the medical officers of the Volunteer Force to perform.

THE SINKING OF THE "LLANDOVERY CASTLE."

THE results of a careful inquiry made by the Minister of Overseas Military Forces of Canada, Sir Edward Kemp, into the sinking of H.M.H.S. *Llandovery Castle* on June 27th are embodied in a report published in the August issue of the *Bulletin of the Canadian Army Medical Corps*. The report states that "official verification of the facts surrounding the sinking of H.M.H.S. *Llandovery Castle* confirms two main points—the supreme devotion and valiant sacrifice of the medical personnel and the ship's company, whose courage and resignation were in keeping with the proudest traditions of the British army and Merchant Marine Service; and the utter blackness and dastardly character of the enemy outrage on this defenceless institution of mercy—a crime surpassing in savagery the already formidable array of murders of non-combatants by the Germans. Deliberate in its conception, every circumstance connected with the incident reveals the German in the light of the cunning murderer who employs every foul means of destroying all traces of his despicable crime. No other explanation can be attached to the systematic attempts of the submarine to ram, shell, and sink the lifeboats and wreckage floating helplessly with their two hundred and fifty-eight unfortunate victims, one hundred and sixteen miles from land—a work of destruction so successfully performed that only one boat, containing twenty-four survivors, escaped." The ship had been in the service of the Canadian Government as a hospital ship since March, 1918, and had made four voyages to Halifax. She was on her return voyage, carried a crew and the regular hospital establishment, but no military patients, nor any passengers. The accusations of the German submarine commander that she had on board American flying officers or munitions of war are pure fiction. "The regulations covering the control of hospital ships were being observed, both in the spirit and the letter." It is clearly established that there was no ground whatever for mistaking the ship for anything other than what she was—a ship immune by every law of war and peace from attack or molestation. One medical officer, a sergeant, and four privates of the C.A.M.C. were saved; all other members of the medical personnel were lost, including the commanding officer, Lieut.-Colonel Macdonald, of Port Hawkesbury, Nova Scotia. Throughout it all nothing stood out more brilliantly than the courage and coolness of the fourteen Canadian nursing sisters, every one of whom was lost. The number of the submarine which torpedoed the ship without warning is not mentioned, nor the name of its commander. To the communication issued by the Admiralty on September 6th, enumerating the fate of the commanders of 150 German submarines sunk, is an appendix in which it is stated that the names of German officers guilty of particularly wanton or despicable outrages are carefully noted by the Admiralty, and special endeavours are made to bring their active careers to a swift end. Among the five mentioned as prominent in this disgraceful list is Kapitänleutnant Wilhelm Werner, "who excels in the sinking of hospital ships."

FOOD RESTRICTIONS IN THE FRENCH REVOLUTION.

DR. R. HELOT of Rouen has given an account,[1] based on documentary evidence, of the food restrictions imposed before the French Revolution and continued during the Republican and Napoleonic wars; they reached an acute stage in the period of the Continental blockade. In 1789 corn was already scarce, and the Government was faced with the necessity of taking steps to check the rise in prices. The starving people cried to the National Assembly, "Bread, and not so many long speeches." In 1792 the National Convention made many enactments dealing with profiteering. The exportation of grain from the territory of the Republic to Holland and elsewhere, where better markets were to be got, was made a capital offence; interference with the free access of provisions to Paris was also punishable by death. Many arrests were made in consequence of riots caused by the holding up of supplies and the inflation of prices. The Convention attempted to grapple with the problem of food for the poor. The price of grain was out of proportion to the wages of working people; therefore taxes were levied on "large fortunes," out of which was defrayed the excess in the price of bread compared with the wages of necessitous citizens. This looks very like our super-tax and ninepenny loaf regulation. In 1793 it was decreed that "every merchant, cultivator, or proprietor of grain and flour shall be compelled to make to the municipality of his place of domicile a declaration of the quantity and nature of the grain or flour in his possession, and approximately of the amount of grain remaining to be threshed. . . . Every citizen convicted of selling or buying grain or flour beyond the maximum price fixed shall be liable to punishment." In the same year an ordinance was made that land neglected by the owners or farmers called up for army service or abandoned for whatever cause should be

[1] *Chronique Médicale*, June 1st, 1918.

cultivated by daily labourers, or by the neighbouring proprietors or farmers. Grain from abroad reached Paris with difficulty, the convoys being attacked on the way. The imposition of a maximum tariff made the famine more acute; cultivators held up their produce while waiting for better prices. Meat and bread were rationed; salt was scarce, and could be obtained only by holders of bread cards. These measures seem to have had some success, for during the following years provisions became more abundant. Nevertheless, the Government continued to watch with anxious vigilance over the food supply.

THE COUNTESS OF DUFFERIN'S FUND.

THE thirty-third annual report of the National Association for Supplying Female Medical Aid to the Women of India for the year 1917, drawn up by the honorary secretary of the Central Committee, Lieut.-Colonel H. Austen Smith, I.M.S., and Dr. Margaret Balfour, joint secretary, gives evidence of continued progress and good work. A large map which accompanies the report shows the location of some 107 hospitals staffed by women—a condition unexampled in any other country. Two new hospitals at Amritsar and Quetta were opened by Lady Chelmsford, who visited a number of existing institutions. The Women's Medical Service continues to render excellent duty in charge of twenty-one hospitals. Several of its members volunteered for civil employment to liberate officers of the Indian Medical Service for war work, and one of them was employed, at the head of a unit, in a military hospital. A conspicuous feature of the report is the increasing effort to educate women in medicine. A return indicates that 144 were studying for university degrees and 205 for lower qualifications. In the Lady Hardinge Medical College at Delhi, now in its second year, 52 women were being instructed for the higher examination. A great number of native *dais* were also under training throughout India. The report specifies many objects which remain to be fulfilled in promotion of the fundamental ends of this beneficent organization. They are: more well-equipped and staffed women's hospitals to form centres of training for nurses, compounders, and midwives; schools where young women of respectable families can be trained by their own sex in large numbers as subassistant surgeons; special classes where women health visitors and sanitary inspectors can be passed out; maternity centres; organizations for supervision of midwives; and post-graduate classes for women assistant and subassistant surgeons. "All this," it is added, "requires money, energy, organization." The funds at the disposal of the association appear to be sufficient to meet present requirements, but for the accomplishment of the purposes thus indicated additional contributions are necessary. The provincial reports show that good work is being done in these hospitals.

MENINGOCOCCAL SEPTICAEMIA.

CASES of meningococcal septicaemia pure and simple, without meningitis, are rare. Professors Morpurgo and Ferrio describe an instance in an elementary school teacher, aged 37. After a prodromal fortnight of morning headache and general debility the disease began suddenly with a rigor, pains in the muscles and joints, a temperature of 104° F., and no headache. The fever fell after three or four hours, with profuse sweating, and for the next month the temperature rose to about 104° F. (on one occasion to 105.5° F.) every evening, returning to about normal every morning. After two months the evening temperature was no higher than about 100.4°, but it rose again three weeks later. Every evening there was a rigor if the temperature was very high; the patient felt shivery if it was lower. The respirations and pulse-rate rose in proportion to the temperature; the pyrexia did not respond to quinine or colloidal silver. The heart and lungs were normal, the spleen was not enlarged, the liver was a little enlarged and tender, the pupils and the reflexes were normal, the mental faculties were not affected. The patient complained of pains in the bones, joints, and muscles, and there was a little tenderness along the bones of the legs; latterly, too, movement became difficult because of pain in the joints. The joints themselves showed no abnormality. The patient slept well; he was constipated, and after two months of fever was growing thin. He described the appearance of a rash on the second or third day of the disease, consisting of pink and tender papules varying in size up to a centimetre in diameter, appearing on the hands, the legs, the anterior surface of the trunk, and the bald vertex. The eruptions seen by the authors were erythematous and macular, not unlike the spots of typhoid fever or measles in colour and shape, most often on the hands and fingers and flexor surfaces of the arms, lasting a day or so, most conspicuous when the fever was highest. The blood showed 70 per cent. of haemoglobin, and a leucopenia of 3,200; blood cultures made on May 24th and June 5th gave a growth of the meningococcus, agglutinating in 1 in 300 dilution with meningococcal agglutinating serum. The patient's own serum gave practically no agglutination in 1 in 50 dilution. The fate of the patient is not definitely specified, but it is stated that injections of antimeningococcal serum gave excellent results. It would seem that this is the seventh case of meningococcal septicaemia recorded in the literature.

EXPERIMENTS ON ANIMALS IN 1917.

A RETURN showing the number of experiments performed under licences on living animals during the year 1917, and distinguishing the nature of the experiment, has been issued by the Home Office.[1] In view of the pressure due to the war, the chief inspector, Professor G. D. Thane, again submits in summary form his report for England and Scotland. Twenty new places, mostly laboratories connected with Government hospitals or Government establishments, were registered for the purpose of experiments on animals, and seven places were removed from the register. The number of persons who held licences was 671, of whom 392 performed no experiments. The return, giving the names of those licensees who returned experiments, and the number performed by each, is divided, as usual, into two tables for the purpose of distinguishing experiments performed under anaesthesia from those in which anaesthetics were not used. The number in the first category was 1,334; the second is devoted entirely to inoculations, hypodermic injections, and a few other proceedings performed without anaesthesia, and includes 54,208 experiments. The total number of experiments recorded in the two tables was 10,500 less than in 1916. More than 12,000 experiments, about equally divided between the two tables, were performed in the course of cancer investigations; some 19,000 were made on behalf of Government departments and public health authorities; and over 22,600 were for the purpose of preparing, testing, and standardizing serums, vaccines, and drugs. The inspectors frequently visited the various registered places and witnessed a large number of experiments, the visits being made, as a rule, without previous notice. They report that the animals were suitably lodged and well cared for, and the licensees generally attentive to the requirements of the Act and to the conditions attached to their licences by the Home Secretary. Two irregularities only are recorded. The advisory committee appointed by the Home Secretary to assist him with advice in the administration of the Act consists of Lord Moulton of Bank, F.R.S., Sir Anthony Bowlby, Sir John Rose Bradford, Sir Bryan Donkin, Sir Alfred Pearce Gould, Sir Seymour Sharpey, and Mr. Charters J. Symonds.

[1] To be obtained through any bookseller, or directly from H.M. Stationery Office, price 2d.

A brief report by Mr. R. F. Tobin, on the work done in Ireland during 1917, is appended, together with a tabular statement showing the number and nature of experiments performed by each licensee. The number of experiments was 832, of which 720 were simple inoculations; and the inspector records his belief that the holders of licences have obeyed the spirit as well as the letter of the Act, and that experiments were not unnecessarily multiplied.

THE NEED FOR MEDICAL ADVICE IN PARLIAMENT.

WE are asked to state that Dr. Addison, Minister of Reconstruction, will speak at a meeting of the medical profession to be held at Steinway Hall, Wigmore Street, London, W., on October 1st, at 5.30, under the chairmanship of Sir Henry Morris. The object of the meeting is to secure the election of representative medical men to the House of Commons so that expert advice may be available on vital questions concerning the national health. All members of the medical profession are invited to attend.

THE *London Gazette* of September 10th announces that the King has appointed Sir Anderson Critchett, Bt., C.V.O., to be Surgeon Oculist in Ordinary, and Mr. Richard R. Cruise, C.V.O., to be Surgeon Oculist Extraordinary to His Majesty. This notification is in substitution of the announcement in the *London Gazette* of July 19th, 1918.

MEDICINAL OILS AND FATS.

WAR EMERGENCY MEASURES.

WE have received for publication the following memorandum, addressed to the medical profession, on the measures necessary to meet the existing shortage, or a possible discontinuance of the supply, of lard, olive oil, and castor oil for medicinal purposes.

Memorandum by the Home Office Committee.

1. The committee appointed by the Home Office, in August, 1914,[1] to deal with questions of economy in the use of drugs during the war, desire to bring to the notice of the medical profession the present position as regards supply, for medicinal purposes, of lard, olive oil (and certain similar vegetable oils), and castor oil; to invite their co-operation in effecting economies necessary in the national interest; and to submit suggestions for their assistance in this regard.

2. As members of the profession may be already aware, the prior claims, partly of the food supply and partly of munition production, have for some months compelled restriction or even discontinuance of the use of the substances above named for medicinal purposes, and the present position is that: (i) *Lard* is no longer released for medicinal use; (ii) the amount that can be set free for such use of *olive oil* (and of the possible substitutes *sesame* and *arachis* oils) is uncertain; and (iii) little, if any, of the quality of *castor oil* hitherto required for conformity with the Pharmacopoeial standard can be used.

3. To obviate the difficulties that might have arisen through the fact that these substances are ingredients of many official preparations, the General Medical Council, after consultation with the Home Office Committee, directed, in an alteration and amendment of the *British Pharmacopoeia*, 1914 (published in the *London Gazette* of March, 1918), that certain preparations be withdrawn from the *British Pharmacopoeia* until further notice, while in the case of other preparations containing oils and fats, the use of various substitutes was sanctioned.

4. By these alterations of the *Pharmacopoeia* considerable latitude was accorded in the dispensing of prescriptions that contained the official preparations affected. It therefore appeared desirable that some understanding should be established between prescribers and dispensers which should obviate uncertainty, and that this would best be effected by the suggestion of alternative preparations of definite formulae. The Pharmaceutical Society, acting in co-operation with a body of representative manufacturers, and in consultation with the Home Office Committee, undertook the necessary experiments, and have now constructed a set of war emergency formulae which are published by the Society. (*Codex Addendum*, 1918.)

5. The following suggestions are offered for the assistance of practitioners in prescribing, in view of the position as above described.

6. (*a*) *Lard* can no longer be dispensed either as such or as an ingredient of a prescription. A base consisting of 5 per cent. wool fat, 10 per cent. hard paraffin, and 85 per cent. soft paraffin is on the market, and will, it is believed, afford a suitable substitute for most cases in which lard would previously have been ordered. For some cases the practitioner may find it advisable to modify the proportions of the ingredients named.

(*b*) Ointments containing lard, or lard and suet, are now allowed to be prepared with wool fat or paraffin, or mixtures of these in place of the lard or lard and suet which may no longer be used. The base described above (named for convenience *Adeps factitius*) has been found to afford a satisfactory substitute in the preparation of these ointments, and war emergency formulae containing it have been constructed. Practitioners will assist by ordering these formulae, except in special cases in which they think it advisable to modify the composition of the base.

7. (*a*) For *olive oil*, sesame oil or arachis oil may be substituted, but none of these vegetable oils should be ordered avoidably. When required *for external purposes*, a specially prepared mineral oil derived from petroleum (known as paraffinum liquidum flavum) is now obtainable, and will in most cases be found to afford a satisfactory substitute.

(*b*) Four liniments containing *olive oil* have ceased to be official. War emergency formulae, containing the specially prepared mineral oil above mentioned, have been devised; liniments so prepared are on the market, and may be substituted for the former official preparations.

8. (*a*) For *castor oil* it has been found, as the result of investigations by the Medical Research Committee, that the neutralized seconds castor oil, now recognized by the *Pharmacopoeia* and readily obtainable, affords a satisfactory substitute for the first quality oil hitherto used.

(*b*) One preparation containing castor oil has been withdrawn—namely, liq. cresol saponatus.

9. For the preparations containing castor oil remaining official—that is, collodium flexile, lin. sinapis, and liq. epispasticus—the neutralized seconds oil will be used by the manufacturer or chemist in place of the oil previously official.

Alternative Formulae.

The *Codex Addendum* 1918, referred to in the above memorandum, gives alternative formulae for the medicinal preparations containing lard or vegetable oils which have been officially withdrawn as an emergency measure from the *British Pharmacopoeia* 1914, or are now modified therein. It was published in full in the *Pharmaceutical Journal* of August 31st.

The four liniments containing olive oil which have ceased to be official are linimentum camphorae, linimentum chloroformi, linimentum hydrargyri, linimentum terebinthinae aceticum, and alternative war formulae for them are given in the *Codex Addendum*. The war emergency formula for *liquor cresol saponatus* contains linseed oil in place of castor oil. With regard to ointments, lard substitute (*adeps factitius*) is considered suitable for use in place of prepared lard in making *adeps benzoatus* and the following unguenta: *Aconitini, atropini, cocaini, iodoformi*, and *lanae compositum*. Benzoated lard made from lard substitute is suitable for use in the following official unguenta: *Cantharidini, gallae, hydrargyri ammoniati, hydrargyri iodidi rubri, hydrargyri oleati, hydrargyri subchloridi, myrobalani, plumbi iodidi, potassii iodidi, staphisagriae, sulphuris*, and *zinci*. No alternative formula is suggested for *unguentum hydrargyri nitratis*. Lard substitute is further proposed to be employed in the preparation of the following unguenta: *Belladonnae, capsici, hydrargyri, hydrargyri compositum, iodi*. The substituted formula for *unguentum picis liquidum* is identical with that of the official preparation except that yellow soft paraffin takes the place of prepared lard. In *unguentum resinae* lard substitute may be used instead of the mixture of yellow beeswax, olive oil, and prepared lard of the Pharmacopoeial ointment. Lastly, the *Codex Addendum* gives the characters and tests of the mixture of liquid hydrocarbons known in the war emergency formulae as *paraffinum liquidum flavum*.

The *Addendum* is published under the direction and by the authority of the Pharmaceutical Society, which alone is responsible for the formulae and for the publication of them in or through the *Pharmaceutical Journal*.

[1] The present members of the committee are as follows: Dr. J. Smith Whitaker, of the National Health Insurance Commission (chairman); Sir Thomas Barlow, Bt., K.C.V.O., ex-President R.C.P., Consulting Physician, University College Hospital; Dr. Alfred Cox, O.B.E., Medical Secretary of the British Medical Association; Dr. E. Rowland Fothergill, Member of the Council of the British Medical Association; Dr. B. A. Richmond, Secretary of the London Panel Committee; Dr. F. J. Smith, Physician, London Hospital; Dr. W. Hale White, Physician, Guy's Hospital. The secretary is Dr. E. W. Adams, Medical Officer of the National Health Insurance Commission, late Lecturer in Pharmacology, University of Sheffield

THE WAR.

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Killed in Action.

MAJOR F. N. JOHNS, M.C., N.Z.M.C.

Major Frederick Noel Johns, M.C., New Zealand Medical Corps, was killed in action on August 25th, aged 30. He was the elder son of F. J. Johns, of Wanganui, New Zealand, and was educated at Edinburgh University, where he graduated M.B. and Ch.B. in 1913. He received the Military Cross on January 1st, 1918.

Died on Service.

MAJOR W. A. WARD, R.A.M.C.

Major William Alfred Ward, R.A.M.C., died suddenly at Wellesley House Hospital, Aldershot, on August 30th, aged 50. He was born at Southampton on October 8th, 1867, and educated at the Middlesex Hospital, taking the L.S.A. in 1892 and the M.R.C.S. and L.R.C.P.Lond. in 1893. After acting as casualty medical officer and house-physician at Middlesex Hospital, he entered the R.A.M.C. as surgeon-lieutenant on January 29th, 1896, becoming captain on January 29th, 1899, and major on January 29th, 1908. He was recently employed as specialist in dermatology for the London district. He served in the South African war 1899–1902, in the operations in Natal in 1899, the actions at Rietfontein and Lombard's Kop, and the defence of Ladysmith, including the sorties of December 7th and 10th, 1899; and in operations in 1900–1902 in the Transvaal, the Orange River Colony, and Cape Colony; was mentioned in dispatches in the *London Gazette* of September 10th, 1901, and received the Queen's medal with four clasps and the King's medal with two clasps.

CAPTAIN F. J. AYRE, R.A.M.C.

Captain Frederick John Ayre, late R.A.M.C., died at Mundesley Sanatorium on August 10th of tubercle contracted on active service. He was educated at St. Mary's Hospital, where he gained an entrance scholarship in natural science and the first year scholarship in general proficiency, and took the L.S.A. in 1896, also subsequently the M.R.C.S. and L.R.C.P.Lond. in 1907, and the D.P.H. of the London Colleges in 1913. After acting as medical officer to the Elm House Industrial School for Girls at Parson's Green, he went into practice at Llantwit, Glamorgan, where he was Admiralty surgeon and agent and surgeon to Trinity House. He took a temporary commission as lieutenant in the R.A.M.C. about two years ago, and was promoted to captain on completion of a year's service, but had to resign recently on account of ill health contracted on service.

Captain and Quartermaster A. F. Marshall, Canadian Army Medical Corps, was reported as having died on service, in the casualty list published on September 5th.

Wounded.

Lieut.-Colonel A. H. Habgood, D.S.O., R.A.M.C.(S.R.).
Major A. D. Stirling, D.S.O., R.A.M.C.
Major A. G. S. Wallace, M.C., R.A.M.C.(S.R.).
Captain D. J. Evans, R.A.M.C. (temporary).
Captain J. L. Mackay, M.C., Australian A.M.C.
Captain W. D. Newland, R.A.M.C. (temporary).
Lieutenant W. M. Heald, R.A.M.C. (temporary).
Captain and Quartermaster H. J. Polhill, R.A.M.C.

Prisoner of War.

Captain and Quartermaster J. D. Genese, R.A.M.C.

ERRATA.

The official casualty list published on August 24th contained the name of Captain J. Jaffé, R.A.M.C., reported as killed in action. Captain Joseph Jaffé graduated M.B., Ch.B. at the University of Aberdeen in 1913, and before joining the R.A.M.C. was in practice at Addo Station, Uitenhage, Cape Province, South Africa. He took a temporary commission on May 13th, 1916, and was promoted captain after a year's service. He was attached at the time of his death to the Somerset Light Infantry. We regret that in our obituary notice of Captain Jaffé on September 7th particulars were given of the career of Dr. Jacob Jaffé of Stoke Newington, who, we are glad to learn, is alive and well. In the same issue a similar mistake, due to identity of names, was made in the case of Major John Proctor, R.A.M.C., who died of wounds on August 12th. Major Proctor graduated, as stated, at Aberdeen in 1913, but did not hold the civilian posts attributed to him.

DEATHS OF SONS OF MEDICAL MEN.

Carter, Audsley Ralph, Major Royal Garrison Artillery, attached Royal Air Force, third and youngest son of Dr. Godfrey Carter of Sheffield, killed August 28th, aged 24. He entered Woolwich in March, 1911, got his commission in 1913, went to France with a heavy battery in the autumn of 1914, and had been through most of the fighting there in the past four years.

Gerrard, J. M. H., Second Lieutenant Royal Field Artillery, eldest son of Major-General Gerrard, A.M.S., died on August 28th of wounds received the same day. He was educated at Ampleforth and at the Royal Military Academy, Woolwich; got his commission on June 5th, 1918, and went to France immediately after.

MacGregor, Donald Hamilton, Second Lieutenant Gordon Highlanders, only son of Dr. MacGregor of Jedburgh, killed August 23rd.

Sandoe, C. F., M.C., Captain Duke of Cornwall's Light Infantry, second son of Dr. J. W. Sandoe of Broad Clyst, Exeter, killed August 30th, aged 20. His elder brother, Second Lieutenant M. W. A. Sandoe, Devon Regiment, was killed in action on May 9th, 1917, aged 21.

Dr. W. Ainslie Hollis, Brighton, late President of the British Medical Association, has received information from the War Office that his son, Major H. S. Hollis, R.A.M.C.(T.F.) has been wounded.

MEDICAL STUDENT.

Sheridan, Charles J. G., Second Lieutenant Royal Air Force, killed recently, was a medical student at Glasgow University before joining.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

HONOURS.

MAJOR-GENERAL W. G. A. BEDFORD, C.B., C.M.G., A.M.S., has been appointed an Additional Member of the Second Class, or Knights Commanders, of the Order of St. Michael and St. George, for services rendered in connexion with the war.

The following awards have been made for distinguished and gallant services rendered on the occasion of the destruction or damage by enemy action of hospital ships, transports, and store ships:

D.S.O.—Temporary Lieut.-Colonel A. G. P. Gipps and Major R. B. Purves, R.A.M.C.
Military Cross.—Temporary Captains P. L. T. Bennett and H. W. Hodgson, R.A.M.C.

The following awards have been made for distinguished services in connexion with military operations in Egypt and Hedjaz:

To be Brevet Major.—Captain (temporary Major) W. E. Marshall, M.C., R.A.M.C.
D.S.O.—Major W. McConaghy, R.A.M.C.

The following awards have been made for services rendered in connexion with military operations in East Africa:

C.M.G.—Lieut.-Colonel P. W. O'Gorman, I.M.S.; Lieut.-Colonel R. Tilbury Brown, D.S.O., R.A.M.C. (The brevet promotion for Lieut.-Colonel R. T. Brown, published in the *London Gazette* of January 1st, 1918, is cancelled, and the above award is substituted.)
D.S.O.—Major R. S. Kennedy, M.C., I.M.S.

OFFICERS MENTIONED.

The names of the following officers of the R.A.M.C. have been brought to the notice of the Secretary of State for War for valuable services rendered on the occasion of the sinking or damage by enemy action of hospital ships, transports, and store ships:

Lieut.-Colonel H. S. Anderson, C.M.G.
Temporary Lieut.-Colonel A. G. P. Gipps.
Major and Brevet Lieut.-Colonel J. C. Furness, (S R.), (deceased).
Temporary Captain (acting Lieut.-Colonel) W. Penberthy.
Majors: W. S. Crosthwaite, J. H. E. Priestley, C.M.G., R. B. Purves.
Temporary Majors W. E. Home and G. S. Samuelson.
Captain C. E. W. Wilmot.
Temporary Captains: P. L. T. Bennett, T. L. Butler, E. G. Fenton, J. H. Glover, P. Gully, H. W. Hodgson, H. E. Moore, J. L. Rentoul, J. Robertson, R. A. Shekleton, H. Slater, T. Tierney.
Temporary Lieutenant: R. H. Thomson.
Quartermaster and Honorary Captain: J. T. Starkie, M.C.

England and Wales.

NATIONAL INSURANCE IN LONDON.

FROM the accounts of the Panel Committee for the medical year 1917, set out in the *London Panel Committee Gazette*, it appears that the total receipts amounted to about £2,424, and after paying salaries and all expenses there remained a balance of about £110. A certificate from two panel practitioners is added giving their opinion that "the expenditure has been conducted with all due care and economy." There has been no expression of opinion to the contrary, and the Commissioners have extended the life of the Panel Committee for another year. The Committee announces that it can take no official action to obtain direct representation in Parliament of the London panel profession.

Dealing with the treatment of tuberculosis, the Committee urges panel practitioners to assume their proper responsibility for the domiciliary treatment of tuberculous insured persons, as grave disadvantages may accrue to the profession should there be any apparent shirking of this responsibility. The doctors should advise all cases of tuberculosis to apply for sanatorium benefit. At a conference between a subcommittee of the Panel Committee and the tuberculosis adviser of the London Insurance Committee it was stated that there are now about 230 cases waiting for sanatorium beds, as compared with about 500 a few months ago, and whereas a wait of four to six months had been the rule, this, owing to certain administrative changes, had been reduced to about two months. Practitioners are specially requested to classify cases as far as possible so as not to recommend unsuitable cases for treatment in a sanatorium, remembering that the sanatorium is not intended for advanced cases, but only for those that are curable. It is understood that discharged soldiers have a priority over civilians, but in practice both classes have about an equal chance of admission. As to the treatment after discharge from a sanatorium, the tuberculosis dispensaries should be defined as centres for consultation between the tuberculosis officers and the practitioners in charge of the cases. The medical adviser pointed out that the value of domiciliary treatment was diminished by the housing and social conditions of the insured, and practitioners were urged to interest themselves in these points, and to furnish any information they might obtain. It is hoped that in this and other ways panel practitioners will co-operate as far as possible with the medical adviser and the dispensaries. An interesting memorandum by the medical adviser on social conditions among the tuberculous insured will be found in the *National Insurance Gazette*.

Discussing the question of the provision of serums and vaccines for insured persons, it is announced that the Panel Committee and the Local Medical Committee have passed resolutions to the effect that while the *preparation* of autogenous vaccines does not fall within the scope of a general practitioner of ordinary competence and skill, the *administration* does so fall, and, further, that the cost of such vaccines ought not to be borne by the Drug Fund, but should form part of medical benefit.

Attention is called to the need for an exact observance of the rules of certification, especially as regards the avoidance of the antedating of certificates and the giving of final certificates after work has been resumed.

CARE AND TRAINING OF DISABLED MEN IN BIRMINGHAM.

The Birmingham War Pensions Committee has established a very efficient organization for the care and training of disabled soldiers. From a recent article in the *Birmingham Post* we learn that since the war began down to June last 14,600 Birmingham men have been discharged as disabled or physically unfit. Of this number 5,543 have been treated either as in-patients or out-patients, by arrangement made between the Citizens' Committee (which is the local War Pensions Committee) and the civil hospitals, the V.A.D. hospitals, convalescent homes, and the Special Pensioners' Hospital. Of this number about 4,000 have been discharged in the best attainable condition. Speaking generally, a thousand men are always under treatment locally. Of the number who have passed through local institutions close upon a thousand have received training to undertake work in various callings, and it is estimated that about 800 have thus been converted into useful and self-supporting citizens. Courses of training for various trades and callings are arranged, and for this Birmingham, with its variety of industries, affords excellent opportunities. Among the trades taught are art metal work, architectural drawing, badge and button making, basket-making, boot-making and repairing, brasswork, cabinet making, carpentry, cinematography, dental mechanics, diamond cutting, electrical engineering, leather work, piano tuning, and printing. Training is also given in accountancy and clerical work. When a man is discharged he is taken in hand by the Training Subcommittee, which includes members representative of almost every large trade in the district and of various trade unions. The Pensioners' Hospital in Lodge Road was opened about a month ago; it is established in the old City Hospital, which was placed at the disposal of the Ministry of Pensions by the Birmingham corporation. Patients are received not only from the city, but from the counties of Warwick, Worcester, Stafford, and Shropshire, on the recommendation of the various local Pensions Committees. Two blocks are at present in use containing 50 beds, and this accommodation will shortly be increased to 200. Of the 50 beds, 36 only are at present in use, but when the institution is better known, and the Pensions Committees in the adjoining counties exercise fully their powers of nomination the whole of the accommodation at the hospital will probably be utilized. The cases taken are both medical and surgical. In the surgical department there is need for a larger operating theatre. The resident medical officer is Dr. Russell Harper, Major Lucas, surgeon to the General Hospital, is consulting surgeon, and Dr. Walter Jordan consulting physician. The Inter-Allied Exhibition, showing methods adapted for the after-care of disabled men, was opened by the Minister of Pensions on September 9th, and a conference was held on the four succeeding days, at which discussions took place on the training and after-care of disabled men and their place in industrial life.

PROPOSED UNIVERSITY OF THE EAST MIDLANDS.

An article in a recent issue of *Nature* conveys the impression that considerable progress has recently been made towards the establishment of a university of the East Midlands. The movement started some years ago in connexion with University College, Nottingham, and the proposed university would have its foundation in that institution. It is, however, anticipated that neighbouring cities and counties would enter into a federal relation through the development of existing educational institutions and the establishment of new. The Agricultural College maintained jointly by the councils of the East Midlands at Kingston, near Loughborough, is marked out for the agricultural faculty, and it is believed that the close proximity of Leicester and Derby will make it easy for the services of professors and lecturers to be shared. The corporation of the city of Nottingham, which founded the University College in 1881, is ready to hand over the present site and buildings, estimated to be worth £200,000 and to make a permanent annual grant of £15,000 when the university charter is granted. Nottinghamshire County Council has promised a grant of £5,000 a year under similar conditions. Neighbouring authorities are friendly to the scheme, and the mayor of Nottingham has undertaken to raise an endowment fund of £150,000. It is hoped that the new university will not only further the application of science to industry, but will embody the spirit of humanism by working in close touch with the artisan classes, and especially with the Workers' Educational Association.

Scotland.

INCORPORATED SANITARY ASSOCIATION OF SCOTLAND.

THE forty-fourth annual congress of the Incorporated Sanitary Association of Scotland was held last week at Stirling. On September 5th a discussion on the proposed Ministry of Health was opened by Dr. A. Campbell Munro, county medical officer, Renfrewshire. Scottish business in the past, he said, had been neglected on

retarded largely because the Secretary for Scotland was not a member of the Cabinet; by increasing the importance of the office the Secretary would be in a position to press, within the Government, the requirements of a Ministry of Health which should embrace all matters predominantly concerned with the prevention of disease. It was resolved to recommend that a Ministry of Health for Scotland should be established as part of its local government administration, distinct from that proposed for England, with the Secretary for Scotland nominated as Minister of Health, and assisted by a parliamentary secretary in subordinate charge. On September 6th a paper by Dr. Edward McConnell of Glasgow, on the State and prenatal care, was read by the secretary, and formed the opening contribution to a discussion on certain phases of maternity and child welfare. Dr. McConnell moved a resolution that, in view of the loss of infant life in the cities, towns, and populous districts in Scotland, the Government be requested to appoint a Royal Commission to inquire into the whole subject of prenatal conditions so far as they operate adversely upon infant life in Scotland, and to report thereon. The resolution, which we are glad to note was subsequently adopted by the Congress, was supported by Dr. J. W. Ballantyne (Edinburgh), whose remarks were read to the meeting. He emphasized the need for what he would call for the sake of brevity a Royal Commission on Antenatal Pathology and Hygiene, on which the medical profession should be strongly represented in all its departments. The inquiry should include investigation of the real causes of the deaths (before and after birth) which are at present ascribed to prematurity or to immaturity; the definition, notification, and treatment of stillbirths; the results and possibilities of mother welfare work; the special instruction and examination of medical students in antenatal pathology and hygiene; and the antenatal problems of syphilis and of racial poisons in general. Dr. Ballantyne maintained that the results to be expected from such a Commission would be of great value and wide extent.

The late Dr. Margaret Todd.

Dr. Margaret Todd, who died recently in a London nursing home, was better known to the lay public as "Graham Travers," the author of *Mona Maclean* and other novels; but to the medical profession her most important literary work was the biography of Dr. Sophia Jex-Blake, which was published this year and reviewed in the JOURNAL of August 10th. She was the daughter of James Cameron Todd of Glasgow and Rangoon, and was born in 1859. After studying at the Edinburgh School of Medicine for Women and at Glasgow, she qualified in 1894, and in the same year obtained the M.D.Brux. degree. For a time Dr. Margaret Todd was assistant physician to the Edinburgh Hospital and Dispensary for Women and Children. Her first and most famous novel, *Mona Maclean*, was published twenty-six years ago, while she was still a student, and was largely based on her knowledge of the life of women medical students in the early nineties. The life of Miss Jex-Blake—an able and exhaustive piece of biography—made no reference to the author's own place in the affections and life work of her friend, and this omission is the more to be regretted now that death has closed the careers of both.

Ireland.

Poor Law Medical Officers' Salaries.

The Local Government Board for Ireland has written to the Balrothery guardians relative to a resolution passed by the guardians requesting sanction of an increase of £50 a year to each of the dispensary medical officers of the union. The Local Government Board adhered to the opinion expressed in a previous letter, that the staff of six medical officers was, in the present circumstances, too many for the Balrothery union. A reduction of the staff might be effected without inconvenience to the sick poor or interference with the vested rights by abolishing the now vacant medical officership of the Lusk dispensary district, and the Board urged this course in the interests also of the medical officers, so that their districts might be enlarged to normal size, and their opportunities for private practice thereby improved. Meanwhile, the letter proceeded, the Local Government Board, in order to meet the exigencies of the case, has sanctioned the increase of £50 to each of the doctors. The Board also requested that the guardians should press the medical officers to act as substitutes for one another temporarily, when so required, at a fee of £4 4s. per week. The guardians decided to refer the last request made by the Board to the doctors concerned for their opinion.

Dr. Stephenson, Local Government Board inspector, has informed the Bawnboy board of guardians that unless steps are taken to remove the deadlock between themselves and their doctors, who have refused to discharge their usual duties, the Local Government Board would have to intervene and fix the salaries by applying for an order to the King's Bench.

Graded scales of salaries with a maximum of £250, applied retrospectively, have been approved by the Gorey, Wicklow, and Ennis board of guardians.

Canada.

Medical Week.

It has already been mentioned that a number of medical and public health associations met during the same week in Hamilton, Lake Ontario. Among the meetings was a joint assembly of the Ontario Medical Association and the Canadian Medical Association. The address in medicine was given by Dr. Lewellys F. Barker, of Johns Hopkins University, who, in dealing with the significance of heart murmurs found on examination of candidates for military service, laid particular emphasis upon the condition of the heart muscle and its ability to bear strain as being the factor of prime importance in the examination of such candidates; heart murmurs might or might not be of significance, although a careful study of them should not be neglected. The address in surgery was delivered by Dr. Charles H. Mayo, of Rochester, N.Y., who spoke on cancer and its treatment. Dr. Mayo referred to the increasing prevalence of this disease in the United States, and declared that 200,000 cases existed in that country, 80,000 people dying from it each year. Dr. Joseph De Lee, of Chicago, in the address in obstetrics, dealt with the methods of reducing fetal mortality, with special reference to the newer methods of Caesarean section. Asthma in infancy and childhood was the subject of the address in pediatrics, which was given by Dr. Isaac Abt, of Chicago. A number of interesting papers were read and were followed by discussions. Treating of surgery of the colon, Dr. McGuire, of Buffalo, expressed himself as strongly in favour of resection. On June 1st a combined medical and surgical clinic was held at the new hospital recently erected on Mount Hamilton.

The conference was an unqualified success from every point of view and the executive of the Ontario Medical Association is to be congratulated. Contributions were of a high scientific order, and discussions were general and of great interest. Mention should also be made of the museum collection and clinical laboratory contributed by the universities of McGill, Toronto, Queen's, and Western, and the Canadian Army Medical Corps, which included specimens showing different types of war wounds, which form the nucleus of a Canadian war museum. Of interest also were a number of orthopaedic appliances for the treatment and training of returned soldiers, which were sent from Hart House, Toronto University. The moving pictures which were shown daily added to the attractiveness and interest of the meetings.

National Committee for Mental Hygiene.

The Canadian National Committee for Mental Hygiene has been formed to work for the conservation of mental health, and for improvement in the care and treatment of those suffering from nervous or mental deficiency, and for the prevention of these disorders; to conduct or to supervise surveys for the care of those suffering from mental diseases or mental deficiency; and to co-operate with other agencies which deal with any phases of these problems.

The Committee, while not affiliated with the American National Committee for Mental Hygiene, will be conducted

along the same lines, and 50,000 dollars have already been contributed. The establishment of this committee is in great part due to the efforts of Dr. Clarence M. Hincks, of the University of Toronto, who has succeeded in co-ordinating the various individual groups working along the same lines.

ADMISSION OF WOMEN STUDENTS OF MEDICINE.

The Corporation of McGill University has formally approved a recommendation made by the Faculty of Medicine, that women should be admitted to the study of medicine provided they have completed the first and second years in Arts at McGill University, have taken an Arts degree from a recognized university, or are prepared to take the double course of B.A. and M.D. or B.Sc. and M.D. at McGill. Women students are now admitted also to the medical faculties of Toronto, Queen's, and the Western Universities.

A department of social service and a school for physical training for masseuses has been inaugurated at McGill University. It is probable also that a school for the training of nurses will shortly be established, and the establishment of a course of instruction for nurses in anatomy, physiology, and materica medica is at present under consideration.

Correspondence.

RECRUITS WITH DOUBTFUL HEART CONDITIONS.

SIR,—In the second of the valuable reports upon this question by Dr. Russell Wells,[1] Dr. Wells kindly alludes to my views on chorea, and writes thus: "Some writers following Poynton," etc. I should not for a moment desire to claim any priority for the view expressed as to the rheumatic nature of chorea. I was taught it by Dr. Cheadle, Sir Dyce Duckworth, Sir Thomas Barlow, and others of senior standing to myself. In France also the view dates back many years. My only claim for consideration lies in the evidence Dr. Paine, Dr. Gordon Holmes, and I brought forward to explain the association. This was briefly: (1) Demonstration of the strepto-diplococcus in the meninges and connective tissue of the brain in the region of the blood capillaries. (2) The isolation of the micro-organism from the cerebral tissues and the production of other rheumatic lesions when it was intravenously injected. (3) The production of choreiform movements. (4) The demonstration of morbid changes in the cerebral nerve cells.

I suppose no greater experiment on the importance of fright as a primary factor has been attempted on man than the London air raids. Yet there is no evidence that chorea has notably increased. It is more than probable that other infections may rarely produce chorea—for example, congenital syphilis and tuberculosis. Can any other agent than an infection produce chorea is the problem which it is so difficult to decide and yet so important to settle. If shock can do so, then in the future one sees some hope of studying the chemistry of shock through a deeper knowledge of the exact nature of the rheumatic poisons.—I am, etc.,

London, W., Sept. 6th. F. JOHN POYNTON.

MEDICAL EDUCATION IN ENGLAND.

SIR,—Many years of teaching experience in a medical school make me endorse the conclusions of Sir George Newman's memorandum to the Board of Education in reference to the preliminary sciences—namely, (*a*) that these should form part of a post-school medical curriculum (p. 26), (*b*) that their syllabus cannot be materially reduced without detriment (p. 28). The right way to ease the student's "burden" is not to give him a preliminary canter in these sciences at school, but to so extend his mathematical and literary equipment there that he will know something of the language of these sciences when he begins their study. At present this preliminary equipment is in most cases so inadequate, or unsuitable, that the student is in the position of a reader who attacks a book in a foreign language which he has never learnt; it is the use of the dictionary which he finds burdensome, and even with that the progress is slow. The statement that a property of an element is a periodic function of its atomic weight should illuminate his chemical path at once, but it often bewilders him because he has no idea what a function of a variable is. The logical deduction of such important conclusions as $\frac{VP}{T}$ is constant, or $\frac{F}{Ma}$ is constant, from the experiments is only difficult because he has not learnt the proposition in variation which sanctions the deduction. The convenient notation of the differential calculus is rapidly becoming part of the alphabet of science: the student should learn at school to use this fluently and to differentiate and integrate simple functions with respect to one variable; his preliminary equipment should also include sufficient dynamics and hydrostatics to follow easily an account of the kinetic theory of gases, osmotic pressure, etc. It seems superfluous to say that his literary education should have made him quite conversant with the prefixes and suffixes of classical origin which abound in the vocabulary of science and medicine, yet many students have assured the writer that the lack of this education proved a real obstacle to their progress!

I have only space to indicate a few educational lacunae which the secondary schools could, and should, fill; by filling them they would do the student a real service. The preliminary canter in chemistry, etc., does not prove to be of great use: for some reason or other, students who have not had this canter often by the end of the first year reach a higher standard in the science than those who have had a school course. Moreover, in the study of science the initial point of view is so important that every teacher likes to begin *de novo*. The general principles of every science must be exhibited in illustrations and, when the science is part of a professional curriculum, the interest and progress of the student is most easily secured by illustrations which have some professional flavour or application. These, however, are only suitable when the audience is practically homogeneous: that can only be expected in a medical school. I incline to think, too, that school teaching, necessarily more dogmatic in type, is more suitable as a vehicle for the exact science of mathematics than as an instrument for the development of the open mind so essential to a medical man.—I am, etc.,

London, W.C., Aug. 30th. HUGH C. H. CANDY.

MEDICAL REPRESENTATION IN PARLIAMENT.

SIR,—The decision of the British Medical Association to further the candidature for Parliament of approved medical men, and the appointment of a Parliamentary Elections Committee, is gratifying to many of us who for years have taken special interest in public affairs, including those affecting the profession. The composition of the committee, however, as announced in last week's SUPPLEMENT to the JOURNAL, excellent as it is, calls for one comment. In addition to the woman member and the four *ex officio* members, fourteen men have been selected, most of whom live in London, several being consultants. There appear to be only three typical general practitioners from the provinces.

To ensure the success of the movement, and of the proposed financial appeal, it would seem advisable for the committee to meet without delay and promptly to co-opt four representative general practitioners of repute (outside London) who will command the confidence and esteem of their provincial colleagues.—I am, etc.,

Bilston, Sept. 10th. T. RIDLEY BAILEY.

THE TREATMENT OF SCARLET FEVER.

SIR,—The note in the JOURNAL of August 24th on a circular letter from the medical officer of health embodying a request made by the Metropolitan Asylums Board that mild cases of scarlet fever and "bacteriological diphtheria" should be treated at their own homes, thus leaving beds available for more serious cases, raises a number of questions. You state certain of these, perhaps the most urgent; but you ignore one which asks itself, week in week out, year after year, to practitioners and parents and the public generally, one which threatens the foundations upon which our isolation hospitals are built, one which leaps from the request of the Asylums Board—How should cases of scarlet fever "be treated in their own homes?"

[1] BRITISH MEDICAL JOURNAL, September 7th, p. 248.

It appears to me that the present difficulty in regard to hospital accommodation offers the profession in the London area a splendid opportunity to prove that more things are wrought by drugs than the newest school of medicine dreams of. It is the fashion to scoff at physic, and in many hands (ready and skilful enough in other emergencies) the treatment of scarlet fever has declined into what their owners would reckon "a wise and masterly inactivity"—symptoms are treated as they arise—and six weeks of seclusion end in vague hopes that the hash of one colony of microbes has been effectually cooked, or in dogmatic assurances which too often prove unfounded. There are many ways to treat scarlet fever; most of them claim but little in the line of striking results, and a glorious uncertainty attends their issue: there is one method—only one that I know of—which frames big promises, and generally makes good. That is the Milne method. It is begun the moment the case is diagnosed—sooner if there be reasonable grounds for suspicion. The patient is rubbed with pure eucalyptus oil carefully all over the body, from the crown of the head to the soles of the feet, both morning and evening, for the first four days, then once daily until the tenth day; the throat is swabbed with carbolic oil, 10 per cent., every two hours for the first twenty-four hours. At first the diet is soda-water or hot water and milk in equal quantities; in a few days light diet is allowed; and by the tenth day ordinary meals. For three weeks care must be taken to avoid cold, and patients must be warmly clad. "When the patient is moved from one bed to another before the treatment is used, then the first bed and bedding should be disinfected. The same applies to clothes the patient may have been wearing before the treatment." Otherwise nothing need be done—"clothes, toys, books, etc., are harmless."

That in outline is the whole affair—simple to a fault; but it works, as many a man who tried it incredulously has been forced to confess. Years of experience of the method have only confirmed my faith in it. Sometimes I have tampered with the original prescription to the extent of substituting for the detested oil swabbing a throat spray of paroleine and medical izal, and the results have proved unfailingly satisfactory—cases have run an easier course than seems possible by any other plan, and infection has ended with the inception of treatment. I cannot say that severe symptoms and complications are impossible, but they more rarely happen. From the purely selfish aspect, what a comfort for the medical man abides in this method's solution of the infection question! Visit your scarlet fever patient when you like, you carry no mischief into other houses; if but the simple necessities of this treatment be observed, a patient's home and its members cannot menace the community. At the period when, attending my own child in my own home for scarlet fever, I put this method to the sincerest test, I had to manage a difficult first labour. Explanation was made to the patient and the alternative of another practitioner offered, even urged, but she insisted. So I went. The case necessitated a long chloroform anaesthesia, instruments proved ineffectual, and finally podalic version had to be done. Mother and baby did well. Neither in that case nor in a couple of other cases attended during the same period was there any rise of temperature, and I practically lived in the fever room at the time.

If a general confidence in the method could be established and the treatment carried out efficiently on the largest scale, two notable results would follow—(1) the liberation of very many big hospitals for military or other purposes, and (2) the saving of much public and private expenditure at a time when such economy is a national duty.—I am, etc.,

Belfast, Sept. 3rd. ROBERT WATSON.

THE LABOUR PARTY AND THE MEDICAL PROFESSION.

SIR,—I have pleasure in replying succinctly to Dr. Brackenbury's courteous but searching inquiries.

Speaking for myself, but believing that I express also the opinions of the Labour party, I am wholly in favour of all the work of the medical profession which is paid for or aided from public funds, or of which the State takes any cognizance, being placed under the Ministry of Health, for the counsel and criticism of which there should be a statutory advisory medical committee. I do not understand how it can be suggested that all the medical staffs can be "amalgamated" into a single staff, whether whole or part time, paid by salary or otherwise. But it seems to me that all branches of medical service should be effectively open to—and should, in fact, be recruited from—all kinds of duly qualified medical practitioners. There has been in the past too much separation, too much segregation, and too much virtual exclusion. There should be in future the closest possible relation ("co-ordination" is not enough) between the various services, whether central or local; clinical or preventive; institutional or domiciliary; in connexion with maternity centres, schools, hospitals, and the manifold duties of local public health departments or with the treatment of the individual patient, under the Insurance Act or otherwise.

Similarly, I think that in each locality all such forms of "public" medical service should come under the supervision of a single local health authority, upon which the medical profession of the locality should be entitled to representation, and for the counsel and criticism of which there should be, in addition, a statutory advisory medical committee made up of the local practitioners of all kinds.

I do not see how it is possible to make the medical profession, thus organized in the public service, either wholly full-time salaried, or wholly part-time salaried, or wholly fee-paid; wholly paid from the taxes, or from the rates and grants in aid, or from an insurance fund, or by the individual patients. This is equally the case whether we consider the Ministry of Health or the local health authorities. Let me say specifically that a universal whole-time salaried service, where no medical practice would be carried on by independent practitioners freely serving their own patients in their own way, is as inconceivable by me under the local health authorities as under the Ministry of Health.

But it is plain that there will have to be some increase of the various whole-time salaried services (whether, in the improvement of medical education, of professors and lecturers in the medical schools, of medical officers of health and other administrators of county and municipal health services, of resident officers of institutions, of medical officers of various kinds in the Ministry of Health, or what not). It is equally plain that there will need to be in the new services (if only by the absorption of the 4,000 Poor Law district medical officers) a great many part-time salaried medical posts of various kinds. It is no less certain that the very early increase in scope of the work now performed under the Insurance Act, notably in the rural districts, will necessitate a great increase in that part of the medical work of the general practitioner for which he will not be dependent on the fees that he can collect from his patients; and no other arrangement for the public payment that will have to be made to him seems practicable, at least over the greater part of the kingdom, than either a part time stipend, or some form of fee per capita, or per act of service—not, I hope, so complicated and inequitable as the present panel practice payments.

What has to be worked out—and this, I think, should be done by the medical profession itself—is the plan of co-ordinating all these different forms of the medical service for which the central and local governments will be responsible. The one thing I see clearly is that no simple or universal phrase or formula will suffice.

I entirely agree that it should be an essential part of the work of Government to maintain a central department of medical research and statistics; and that this should be quite independent of the administrative services, and not form a part of the Ministry of Health, or of any other executive Ministry. At the same time, this must not preclude the Ministry of Health from itself carrying out medical researches in matters arising out of its administration—so to speak, of "topical" character—as the Local Government Board now so usefully does; and, of course, the medical experts of the Ministry of Health would have to be in the closest possible touch with the independent Department of Medical Research. It must be remembered, too, that this independent Department of Medical Research, of which we have already the beginning under Sir Walter Fletcher, must, according to the British Constitution, be answerable to some Minister, who can speak for it in Parliament. It has been suggested that there should be, in the reorganization of government now pending, a distinct

Minister of Research, unconnected with any administrative department, who would answer for all the various central Research Departments that will be maintained, whether in mechanics, physics, chemistry, biology, medicine, industrial technology, the technique of administration, economics, statistics, or history.—I am, etc.,

London, S.W., Sept. 10th. SIDNEY WEBB.

THE FUNCTION OF THE CARDIAC VAGUS.

SIR,—Few physiological problems seem so confused as that of inhibition. It occurred to me some time ago that this was due to the rash acceptance of the Weber brothers' theory of the function of the cardiac vagus. Professor Keith now tells me that H. O. Thomas, a worker at last coming into his own, had expressed the same opinion. It seems that we both inferred from different premisses that phenomena due to experimental stimulation of the vagus were the result of shock and could not be explained as inhibition. Sherrington in 1906 used the phrase "inhibition, whatever that may be," and it is certain no one knows.

To believe that any organism has evolved a mechanism by which the heart can be slowed and finally stopped is absurd. It is reasonable to suppose that the vagus and accelerator fibres are of advantage and act as a safeguard. This cannot be tested by operation and unnatural stimulation or by putting pressure on the vagus, disturbing the cerebral circulation, and producing abnormal phenomena. During complete healthy rest the heart is practically autonomous; we can therefore infer that the vagus and accelerators help it during stress. Such considerations go to prove that the vagus does not primarily tend to "slow" the heart. Physiological slowing is but the natural concomitant of better functioning, just as the big muscular efforts of a labourer are, and must be, slow if continued. Thus, under stress the vagus tends to produce the effects seen on the exhibition of digitalis, which can reasonably be inferred to slow the heart by enabling the myocardium to function better. If this is so, shock experiments are not relevant. It seems that physiological vagus action produces more powerful cardiac contractions, which increase coronary circulation and keep the central nervous system blood pressure normal. Probably the stimulus affecting the vagus depends on its increased irritability consequent on a lessened blood supply. This view puts its cardiac action into line with its positive effects on the intestine. It follows that the action of the accelerators is to keep the circulation normal when the heart is no longer able to respond to the vagus by longer, and stronger, and slower contractions, but is still capable of quick, hurried work. If these views are correct, "inhibition" exists only in the casualty ward or laboratory, where shock accounts for the phenomena. I find H. O. Thomas believed "that inhibition is the suspension of life not the action of special nerves." W. M. Bayliss says that both the vagus and accelerators can be stimulated reflexly. I humbly submit that this is their normal function. It follows that to declare, as pharmacologists do, that the action of the vagus tends to render tone less complete than digitalis is to misunderstand the problem. The features of the third stage of digitalis poisoning are merely those of cardiac failure, and the quickening of the pulse is due to the accelerators coming into reflex play to save the organism. If they fail, the efforts of the dying heart degenerate into the inco-ordinated twitches of the separate fibres which form the prelude to the running pulse and death.

Such a view squares with physiology and pharmacology, but when digitalis action has to fit in with the Webers' theory the difficulties are insurmountable. To speak of a heart which has obviously been helped to do its work more quietly and thoroughly as having been inhibited is to confuse the inquiry and misuse language. The Weber brothers discovered an interesting pathological fact which has no particular value, except so far as it throws light on the obscure complexes of shock. H. O. Thomas actually wrote in 1883:

> In proof that mechanical irritation of this nerve (vagus) induces a condition of shock we have the accepted fact that atropine protects the nerve from the shock consequent on mechanical disturbance. I have not yet met with any evidence which proves the existence of any inhibitory nerve fibres in this or any other nerve.

It seems that the confusion in inhibition is due to the wrong belief that such nerves exist. The final explanation of the phenomena which now seem to depend on them will probably show that any nerve is only "inhibited" when another, acting in the same area, is more strongly stimulated. The inhibition of one reflex is the dominance of another, just as, according to Herbart, any mental presentation can be suppressed, or "inhibited," by another strong enough to displace it in causing motor reactions. H. O. Thomas seems to have derived his views largely from a study of drugs, and his work may throw light on the so-called reversal effects of strychnine in converting "inhibition" into excitation by the selective effect of such a drug on certain reflexes.—I am, etc.,

London, N.W., Sept. 5th. MORLEY ROBERTS.

INSTRUCTION IN THE TREATMENT OF VENEREAL DISEASES.

LIEUT.-COLONEL A. B. COTTELL, R.A.M.C.(ret.), informs us that he has addressed the following letter to the Registrar of the General Medical Council:

Dear Sir,—May I request you to place this letter before the General Medical Council as an urgent matter? The press, the pulpit, and even the public now begin to recognize the grave importance of combating venereal diseases, and yet, as I read in the Educational Number of the BRITISH MEDICAL JOURNAL of August 31st, the General Medical Council, in the syllabus of work, do not apparently consider venereal diseases as even worthy of special mention, though a separate heading, No. XII, is devoted to "Theory and practice of vaccination." Could a more absurd division of work be imagined? If No. XII is intended to include the very necessary study of all that is understood by the word "germs," it should certainly say so in plain English.

I write as one who knows the lamentable ignorance of many of the profession on the subject of venereal diseases, and consider the blame lies largely at the doors of the General Medical Council and the examining bodies.

I am, Sir, yours faithfully,

A. B. COTTELL, Lieut.-Colonel (ret.),
National Council for Combating Venereal Diseases.

Obituary.

DAMER HARRISSON, M.CH.LIVERPOOL, F.R.C.S.EDIN.,

Colonel A.M.S.(T.), Consulting Surgeon, Liverpool Northern Hospital.

WITH the death of Damer Harrisson I feel that another link with the past has been severed. We were colleagues at the Northern Hospital for ten years and close friends for over thirty years, so that I had every opportunity of appreciating the sterling merits of an Englishman of the best type. He was a man of great vivacity and indefatigable energy, who always enjoyed life, which he never took too seriously. He was ever young, and no matter how long he lived would never grow old; one who always enjoyed the society of youth and could ever enter into their joys and hopes. He was not a brilliant or showy surgeon, but he was careful, accurate, and thorough in his work, and a sound opinion; many helpless and hapless individuals owe to him their restoration to health and wonted vigour. He was one of the pioneers in modern brain surgery and nerve grafting, work which has been much to the fore in the present war.

As medical officer to the schools for defective children he took great interest in questions of heredity, and his striking paper on the eugenic aspect of the feeble-minded child, copiously illustrated by lantern slides, will be long remembered by those who heard it. A brilliant sally by the Rev. T. W. M. Lund that medical men were largely responsible for the existence of such degenerates found an echo in the minds of many present.

He was an enthusiastic yeoman and long held the position of Surgeon-Lieutenant-Colonel to the Lancashire Hussars I.Y. When the Territorial Force was organized he took a prominent part and became Assistant Director of Medical Services in the Western Command; while holding this position he was appointed honorary surgeon to the King. At the meeting of the British Medical Association in Liverpool in 1912 he was President of the Section of Military Surgery.

When war broke out he took up military work *con amore*. During the great recruiting rush in Liverpool he literally worked night and day. When some examiners were

doing eighteen or twenty cases a day and drawing the maximum pay, Harrisson regularly examined more than 100 recruits, working from 10 a.m. to 10 p.m. He had associated with him four lay assistants or clerks, and the work, although expeditious, was well done; he knew exactly the type of recruit which the army required, and he could size up a man while another was examining a single organ. The fact that very few of his recruits were afterwards turned down was proof of his discriminating perspicacity. When the Conscription Act was passed he had a different type of individual to deal with, but his scrutinizing eye readily detected the malingerer, and he did not hesitate strongly to express his opinion of many of the medical certificates presented to him. He was himself incapable of any mean subterfuge; any certificates which were merely a colourable imitation of the truth drew forth his power of strong invective.

He was a genuine sportsman, and never happier than when riding a steeplechase, and not infrequently he was first at the winning post.

It was always a great pleasure to perceive the strong affection which united all the members of the Harrisson family, and Damer was ever a central figure; those who had the privilege of joining in the family reunions had always most enjoyable evenings. There is only a sister left, but of the rising generation there are many worthy members, and General Harrisson arrived from France in time to see his uncle alive.

Damer Harrison survived by twelve months his only child, Major Roland Damer Harrisson, D.S.O., killed in action. This catastrophe had a very telling effect on the father; he lost his buoyancy, and work became to him more a labour than a pleasure. His end came fairly rapidly and free from suffering, and those who knew his temperament are pleased that he had no lingering illness. About seven weeks ago he was laid up with a sharp attack of influenza. This was followed by extensive cerebral thrombosis, motor and sensory aphasia, and right hemiplegia. He died on September 1st in his 67th year.

JAMES BARR.

JAMES LAMBERT, M.D.GLASG., M.R.C.S.ENG., L.S.A., Birkenhead.

THIS veteran was, until a few years ago, a familiar figure in Birkenhead and Liverpool, and at the medical gatherings of the Liverpool Medical Institution and those of the Lancashire and Cheshire Branch of the Association, of which he was member of Council for many years. He was born in the neighbourhood of Northwich, and in early life was apprenticed to a doctor in Hartford, close by, who kept thoroughbred horses, on which Lambert frequently followed the hounds. He went to Glasgow for his further medical studies, taking his degree there and London diplomas in 1855. This was the time of the Crimean war, when he became surgeon to a transport, afterwards settling in Birkenhead, where he lived ever since. He was for many years a Poor Law medical officer, also surgeon to the Borough Hospital, and all his life took the greatest interest in surgical practice, in which he kept himself abreast by reading, and did some pioneer work there by tying the external iliac artery and performing Pirogoff's amputation of the foot. In all respects his professional judgement was good. Of late years his legs gradually failed, though previously strong and active, and quite recently he became so infirm as to fall in the street and in the house, being unable to rise of himself. His mind and memory remained clear till not many days before the end. He was much respected in Birkenhead and was buried with his parents at Witton churchyard, Northwich, on September 10th. It is estimated that he lived to be 93 or thereabouts.

RUSHTON PARKER.

SURGEON-GENERAL CHARLES PLANCK, Bengal Medical Service (ret.), died at Lyden Croft, Edenbridge, Kent, on August 23rd, aged 87. He was the son of George Planck, Secretary H.M. Customs Department, London, and educated at Guy's Hospital, taking the M.R.C.S. and L.S.A. in 1855; he took the F.R.C.S.Edin. in 1881 and the M.R.C.P.Lond. in 1888. He entered the Indian Medical Service as assistant surgeon on August 4th, 1855, became surgeon on August 4th, 1867, surgeon-major on July 1st, 1873, and deputy surgeon-general on August 4th, 1881, retiring on August 4th, 1886. He served in the Indian Mutiny, when he was field surgeon with Sir James Outram's force which relieved Lucknow, and also took part in the action at Cawnpore in which the Gwalior rebels were defeated, receiving the medal and clasp. Afterwards he held successively the posts of superintendent of Agra Central Prison, of inspector-general of prisons in Burmah, and of sanitary commissioner of the North-West Provinces, now the United Provinces of Agra and Oudh.

DR. JOHN SMITH, of Callander, who recently died at the age of 90, graduated M.D.Edin. in 1855. He had been in practice in the district for over sixty years and had been medical officer of the parish for about fifty years.

Medical News.

DR. THOMAS W. HICKS, M.B.E. (East Finchley), has been made a Justice of the Peace for the County of Middlesex.

AT a meeting of the Dumfries Town Council, on September 5th, Dr. Joseph Hunter, who has been medical officer of health for the burgh during the past fifteen years, was presented by the members and officials of the council with a silver pedestal electric lamp as a wedding gift.

AN American Sanitary Commission, consisting of four doctors and six nurses, sent out by the Rockefeller Foundation, arrived at Guayaquil, Ecuador, on July 9th; it will co-operate in the prevention of yellow fever in that country.

THE widow of Count Della Somaglia, president of the Italian Red Cross, has given in memory of her deceased husband £4,000 to be applied towards the foundation of a hospital for tuberculous children in Rome.

A CASE of rabies in a dog at Plymouth has been confirmed by the Board of Agriculture and Fisheries. Several other suspicious cases have been reported and are now under investigation. In view of these circumstances and the fact that it is known that in more than one instance persons have been bitten by suspected dogs, the Board has made an Order prohibiting the movement of dogs out of the counties of Devon and Cornwall and requiring the control of dogs within a large area of those two counties. Any case in which symptoms suspicious of rabies are observed should at once be notified to the police.

THE National Baby Week Council, which has as its special object propaganda work in connexion with maternity and child welfare, decided at the last meeting of the Council to devote some of its official energies to propaganda work in connexion with the proposed Ministry of Health. A preliminary meeting is to be held at Bedford College, Regent's Park, on Wednesday, September 18th, at 5 p.m., to discuss some of the difficulties presented by the problem from various points of view. (Admission will be by ticket only, which may be obtained from the Secretary, National Baby Week Council, 27A, Cavendish Square, London, W.1.) It is hoped that this meeting will be followed by others in the provinces.

THE war service record of the School of Physic, Trinity College, Dublin, contains the names of over 1,100 past and present students. Of these, 79 have been killed or have died on service. The following honours have been gained: K.C.M.G., 1; C.B., 15; C.M.G., 14; D.S.O., 48; bar to D.S.O., 4; M.C., 78; bar to M.C., 7; Military Medal, 1. Upwards of 160 individuals have been mentioned in dispatches, several more than once, and 13 have received foreign decorations. The students of the other schools of the university have volunteered for service in an equally enthusiastic manner. The registrar of the school will be glad to receive information from those in a position to supply it in order to keep the record up to date.

THE Central Hospital, founded by private subscriptions with a subvention from the Chinese Government, has recently been opened in Peking. It is built from the design of an American architect, and has accommodation for 150 patients. The director is Dr. Wu Lien Te, a graduate of Cambridge and a distinguished bacteriologist, who was president of the International Conference on plague held at Moukden in 1911. The staff includes Chinese as well as foreign physicians and surgeons.

IT is announced that the medical department of the United States army will shortly issue an appeal to American colleges and universities to alter their curriculum so that third and fourth-year students may receive special training which will qualify them as officers and workers in the department. The course proposed is intended chiefly for men who are specializing in biology,

zoology, plant pathology, and agricultural bacteriology. The plan has already been tried in two colieges with such success that the medical department wishes it to be applied in as many as possible.

IN 1916 N. Barlow found that one of the most striking effects of intravenous injection of mercuric chloride in combination with the administration of quinine was the very rapid reduction of an enlarged spleen, justifying the hope that the combination may establish a complete cure more rapidly than quinine alone. Greig and Ritchie (E. D. W. Greig and W. D. Ritchie, *Ind. Journ. Med. Research*, Calcutta, 1917, v, 401–7) have tested this by taking 54 control cases on 30 grains of quinine in three oral doses daily, and 50 cases treated in the same way as regards quinine, but, in addition, by intravenous injection, on alternate days for eight injections, of 11 c.cm. of a solution of mercury perchloride 1 in 1,000 in saline. All the patients were chronic malarial subjects from East Africa and Mesopotamia, who had been under treatment for six months or more in India, and the spleen was three fingerbreadths or more below the costal arch, except in two, in which it was two fingerbreadths. The cases were more chronic than Barlow's. As complications of the injections salivation was noted in two cases, slight phlebitis in three or four, diarrhoea in five, and two cases had febrile relapses and temporary splenic enlargement while under treatment. Although not confirming Barlow's observations fully, the results show that the combined treatment has a greater effect in reducing splenomegaly than quinine alone has; thus, whereas under quinine alone the treatment failed in 16 cases, under the combined method failure occurred in 7 only. The reinforcement of quinine by mercurial injections may therefore be recommended.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

The postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

LETTERS, NOTES, ETC.

MEDICAL men who cycle may be glad to know of a device which is intended to replace the ordinary trouser clip. Walker's bicycle puttee consists of a clip which holds the trouser neatly and securely in place without straining the cloth. It is manufactured by Brown Brothers, Limited, 22–34, Great Eastern Street, London, E.C. 2. The price is 2s. 7½d. a pair, post free.

NEGLECTED PHIMOSIS.

DR. DUNCAN J. MACKENZIE (M.O.H. Glossop, etc.) writes: In these days of increased attention to maternity and child welfare it is well to take note of matters to which the attention of visitors in connexion with the early notification of births should specially be directed. Amongst these I should place phimosis. We see in practice the trouble caused in the adult by the neglect of circumcision in youth. In addition to local effects, the association of heart affections with neglected phimosis inclines one, after making all allowance for the probability that congenital phimosis may be accompanied by other congenital defects or vulnerabilities, to the view that the poison of rheumatism, whatever it is, may be introduced through the retained smegma. When so much of the midwifery in the country is in the hands of midwives, there is, I think, a danger that the slighter degrees of phimosis, or simple adhesion of the prepuce, may be overlooked. In such a case the services of the visitor should come in useful.

ASTHMA AND IDIOSYNCRASY TO HORSES.

AT a meeting of the Medical Society of Christiania on February 6th, Dr. Arent de Besche gave an account of his investigations into the relation of asthma to certain domestic animals. An asthmatic himself, he had some years earlier almost died from the effects of a prophylactic injection of horse serum. For about four months after this he could attend circuses, enter stables and drive horses with impunity, though he could do none of these things previously without precipitating an attack of asthma. He has investigated thirty-one cases of asthma with special reference to idiosyncrasy, and has found in eleven cases that the asthmatic attacks were definitely connected with the presence of horses or their products. When a finger was placed on a horse and then on the conjunctiva of such a patient, conjunctival flushing and oedema with abundant lacrymation ensued. In five of his cases idiosyncrasy to horses was also betrayed by a cutaneous reaction: a drop of horse serum applied to an ordinary vaccination scratch provoking a large wheal. In the case of an asthmatic whose attacks were precipitated by the presence of cats, the conjunctival and cutaneous reactions to cat serum were positive. Another asthmatic showed idiosyncrasy to a certain protein in his food, presumably derived from wheat. In eighteen cases no definite idiosyncrasy could be found to account for the attacks of asthma. Dr. de Besche concluded that the substance provoking asthma in the subjects of "horse asthma" is probably volatile, and laid stress on the importance of excluding idiosyncrasy to the horse (by his conjunctival and cutaneous reactions) before giving an asthmatic an injection of antitoxin obtained from the horse.

SOLDIER'S RISKS.

THE *New York Medical Record* of August 3rd quotes estimates based on statistics of the allied armies which show that a soldier now has twenty-nine chances of coming home to one chance of being killed. He has forty-nine chances of recovering from wounds to one of dying from them. He has one chance in five hundred of losing a limb. He will live five years longer because of the physical training he has received. He is freer from disease in the army than in civil life, and he has better medical care at the front than at home. In other wars from ten to fifteen men have died of disease to one who has died from bullets; in the present war one man dies of disease to every ten whose death is caused by bullets.

THE BELL FUND.

DR. S. A. KINNIER WILSON asks us to acknowledge donations to the Dr. J. H. Bell Fund from Dr. J. Dundas Grant (£2 2s.) and Mr. W. Gilchrist Burnie (£5 5s.). Subscriptions should be sent to Dr. Wilson, at 14, Harley Street, London, W.1.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

Subscriptions to the Second Appeal.

The following subscriptions have been received up to September 9th:

	£	s.	d.
Dr. C. A. Rayne	5	5	0
Dr. Robert J. Carlisle ...	2	0	0
Sir Alfred Pearce Gould (monthly)...	5	5	0
Dr. Dundas Grant ...	10	10	0
Mr. W. J. Shepperd ...	0	10	6
Mr. J. V. C. Denning ...	1	1	0
Dr. Edward Byrd... ...	1	1	0
The Sunderland Pharmaceutical Association*	16	17	6

	£	s.	d.
American Red Cross Commission for Belgium	200	0	0
Captain A. P. Thom, R.A.M.C.	1	1	0
Mr. D. T. Jones, M.P.S.	1	1	0
Mr. E. Spencer Evans (monthly)	0	10	0
Dr. J. B. Davey	1	1	0
Dr. J. Auriol Armitage†	5	5	0

* Per Mr. Cuthbert Hodgson. † Second donation this year.

The munificent gift of £200 from the American Red Cross has been received through Mr. Ernest P. Bicknell, the Commissioner for Belgium, who writes: "This contribution is for the month of September, 1918, and is from the Commission for Belgium of the American Red Cross. A monthly contribution of the same amount will be made for the remaining months of the year."

Subscriptions to the Fund should be sent to the Treasurer, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W.1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

THE Chief Inspector of Factories announces that the post of certifying factory surgeon for Lincoln is vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	6	0
Each additional line	0	0	9
Whole single column	4	0	0
Whole page	12	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive poste *restante* letters addressed either in initials or numbers.